The Iron Age

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The "Haskins" Vertical Steam Engine.

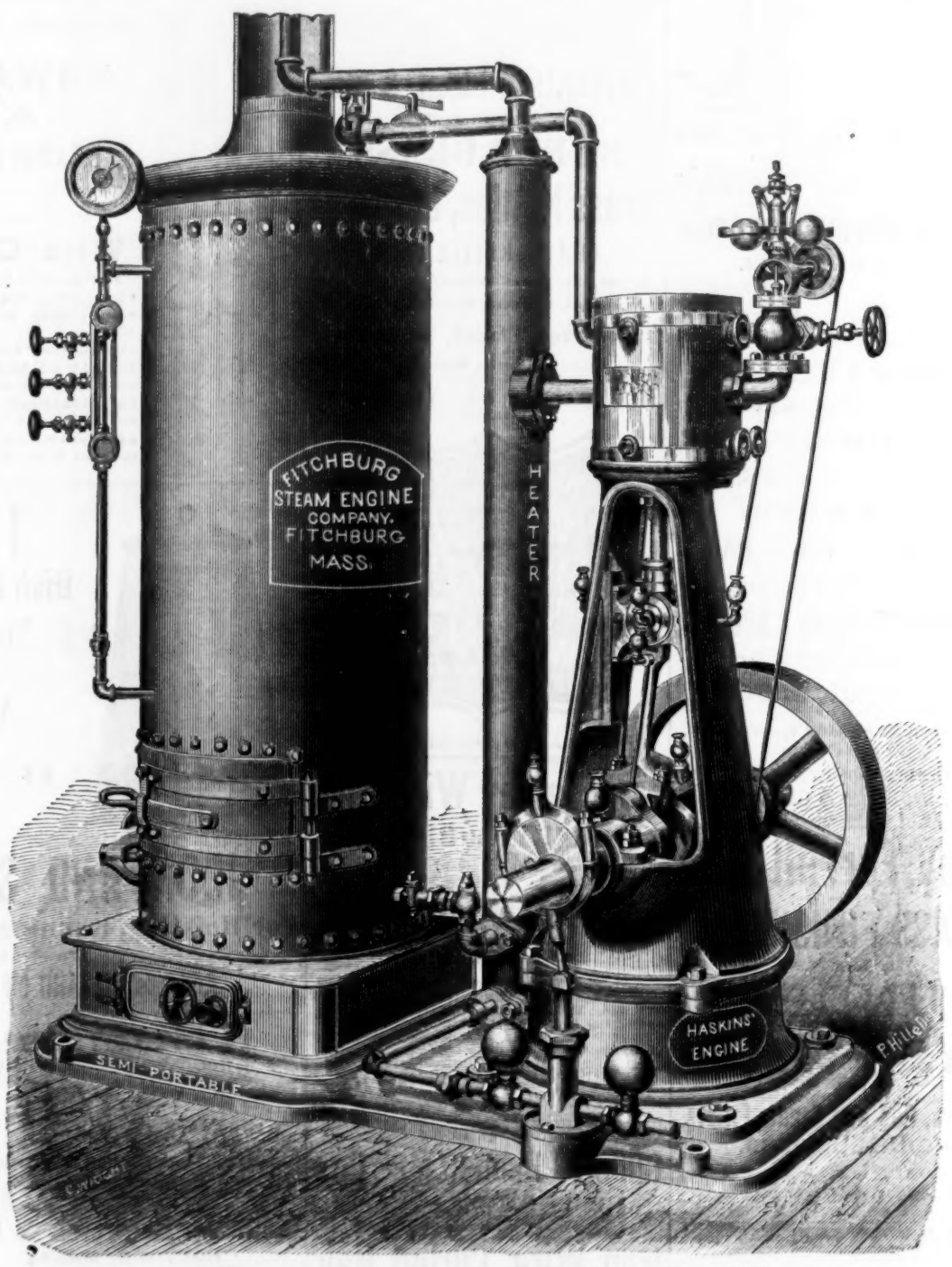
We show in the accompanying illustration the "Haskins" vertical steam engine, manufactured by the Fitchburg Steam Engine Company, Fitchburg, Mass. Within comparatively few years there has been a radical change in manufacturing machinery of all descriptions. Instead of one corporation attempting to manufacture all sorts and kinds, the tendency is to separate the different classes, and to make a specialty of each class to the exclusion of all else. By this concentration of talent and energy a much higher quality and perfection of work is obtained than by the old method. Especially is this true in the manufacture of vertical steam engines; for, when 20 years ago they were made only incidentally to help out in dull times, there are now dozens of manufacturers devoting themselves to that class of engineering, and, as a result, the vertical engine, when well made, is taking its proper rank as the equal of the horizontal in every way, each suiting peculiar conditions best.

With this especial development has come the principle of duplication of parts, so indispensable in the proper manufacture of watches, pistols, sewing machines, &c., and as indispensable in the proper manufacture of good vertical engines, for without it no machine can attain its highest excellence unless at largely increased first cost. This principle has been more or less employed for several years by different makers, but has been brought to a very high degree of perfection by the Fitchburg Steam Engine Company, of Fitchburg, Mass., in the manufacture of the "Haskins" engine. In these engines all the parts, whether small or large, whatever the size of engine (2 to 100 horse-power), are made the exact duplicates of one another by means of special gauges, "jigs" and machinery constructed by the company for the purpose, and as only the very best stock of all kinds is used, they claim an engine as good in all respects as the best horizontal, and to give the best of workmanship and materials at about the price of hand and inferior work. By this construction, even if an engine should pass through a fire or meet with other serious accident, all needed parts to make the engine a perfect one again can be supplied at once at a low price, with the certainty that they will fit their respective places. Even all parts of the valve motion are thus made, and are made positive, so that no person can change the position of parts, and thus lose the good results to be obtained from the engine as originally made. The eccentric block is keyed upon the shaft, and can be set only for right or left-hand motion. Knowing the immense loss arising from the use of the unbalanced slide valve as commonly used, which is from 15 to 25 per cent. of the power of the engine, the company adopted the balanced piston valve, doing away completely with the loss occasioned by friction of the slide valve; while the balanced valve is equally as simple it is much more durable. An experience of some twelve years has proved the value of this valve when properly made, and its great economy in use of fuel.

The company have spared neither care nor expense in fitting up the best machinery possible to manufacture the engine, and it is generally understood that the materials are all that could be desired.

The engines have forged steel crank shafts, steel piston and valve rods, steel pins throughout, best forged iron connecting rods and straight shafts. Main shaft bearings have independent linings or boxes filled with No. 1 Babbitt metal, which can be removed and new ones submitted in case of wear. The whole construction is designed so as to reduce friction to a minimum, which, with the balanced valve, gives, of course, the fullest measure of available power.

The cut shows their semi-portable engine. It contains in itself, upon one bed plate, which is planed upon the under side, boiler, engine, pump, heater and all connecting pipes and fittings between engine, pump and boiler. While the engine is as complete in all its parts as the best portables, some very decided advantages are obtained by placing the engine upon the bed plate instead of attaching it to the boiler. In the position shown it is not inconveniently or dangerously heated from the boiler, nor are the parts strained out of line by unequal expansion or contraction, while the boiler is not injured by the straining and jarring of the engine as must be the case when they are fastened to each other. As they have a heavy and true bed they can be set upon any common floor and in any story. The manufacturers consider these boilers fully as safe as a stove. The company, in addition to engines of this class, also furnish yacht or tug engines complete at low figures. These engines are of the same general character of style and finish as the one illustrated. The manufacturers guarantee the engines made by them both on the score of economy and durability. A very large number of them are in use not only in this country, but in England, Holland, Australia, Mexico, Cuba, etc., etc.



SEMI PORTABLE VERTICAL ENGINE BY THE FITCHBURG STEAM ENGINE COMPANY.

Prevention of Explosions in Coal Mines.

At the last meeting of the North of England Institute of Mining and Mechanical Engineers, held at Newcastle-on-Tyne, Mr. A. L. Steavenson, of the Page Bank Colliery, Durham, read a paper which was entitled, "On an Improved Method of Detecting the Presence of Small Quantities of Inflammable Gas in Coal Mines." The author said there had been many attempts by means of indicators to prevent explosions in coal mines, but all such schemes were clearly impracticable. Nothing short of actual observation in the mine, as required in the various rules, would meet the case. One of these rules was that the deputy overman must descend before the men, and carefully examine with a safety lamp all the working places. Another was that before firing a shot he must carefully examine the place and those contiguous to it. But it had occurred to him that a good deal might be done in assisting the deputy in his very important duty. As was well known to the members of the Institute, the examination with the safety lamp consisted in carefully observing the direction of the flame. When inflammable gas was present in a proportion sufficient to explode, the lamp was, of course, filled with flame, and the required observation a very simple one. But when a lesser proportion was present, then the indications consisted of a cap or tail upon the flame, and it required very great nicety and care to detect small quantities. The nature of that cap appeared to be somewhat disputed, although Prof. Marreco was clearly of opinion that it was carbonic oxide. With a view to render the observation of the safety lamp when making these examinations more simple and effective, the writer had availed himself of one of the beautiful laws which the study of optics in recent years had put us in possession of—generally known as "the law of absorption of lights." By this law of absorption chemists were enabled to recognize the different substances, and by the same law an attempt was now made with a colored medium to shut out the flame of the safety lamp and render evident the pale blue cap (of the carbonic oxide flame) in a manner much more distinct than by the unassisted eye. With this view the writer had had a lamp arranged to receive a small slip of blue-cut opal glass, to be adjusted whenever it was desired to make an examination for gas, or a pair of spectacles might be fitted with glass of that color. It was well known that there was a great difference in the conditions in which gas was found for affording a top or cap to the flame. The gas coming off fresh from a blower could hardly be seen in the flame at all until the lamp filled; while, on the other hand, gas which might have been standing for some time in a disused place would tail up to the top of the lamp before exploding, probably owing to some admixture of carbonic acid gas. But under all these circumstances the writer had proved that the rise of a direct blue glass was most beneficial, enabling the observer to detect the presence of gas when quite invisible to the unassisted eye, the yellow flame having a clear white appearance, and the blue cap a much more distinct and striking effect. With this assistance it was hoped that explosions of gas produced by the firing of shots would be almost entirely avoided, each deputy having with him one or two small pieces of glass with which to make his examination, and by this simple addition easily applied to any class of lamp another valuable aid to coal mining had been obtained. There was no expense, no complication, no miles of wire or pipes, but a mere application in practice of one of the interesting discoveries of pure science.

General Tevfik, of the Turkish army, who is superintending the filling of the Turkish contracts for arms with the Providence Tool Company, makes the following comparison between American and English firearms: He says: "Aside from the question of wood, the American gun is as strong in all respects as the English. As to the comparative finish of the two, much more hand work by filing and hand-fitting the parts is done upon the English than upon the American gun. This is done, however, in filing off the corners and unimportant places. The surfaces of the American gun are finished equal to the English, and no parts can be either too large or to small, otherwise the gun would not stand the test of interchangeability which I spoke of. This shows the admirable exactness with which the American machinery is done."

Deep Mining Shafts in Europe.

Twenty years ago the deepest mining shafts in the world reached only about 2000 ft. below the surface. The very deepest, we believe, was a metalliferous mine in Hanover, which had been carried down to the depth of 2290 ft. The deepest perpendicular shaft to-day is the Adalbert shaft in a silver-lead mine in Przibram, in Bohemia, which has reached a depth of 3280 ft. The attainment of that depth was made the occasion of a three days' festival, and still further noticed by the striking off of a large number of commemorative silver medals of the value of a florin each. There is no record of the beginning of work on this mine, although its written history goes back to 1527. Quite recently an elegant commemorative volume has been written and printed, which is most interesting to those who have a taste for either the actualities or antiquities of mining industry. There are two other localities, however, where a greater depth has been reached than at the Adalbert shaft, but not in a perpendicular line. These are: 1. The Rocksalt borehole, near Sperenberg, not far from Berlin, which a few years ago had been bored to a depth of 4175 ft. 2. The coal mine of Viviers Remus, in Belgium, where the miners, by shaft sinking together with boring, have reached a total depth of 3542 ft. Turning from these two mines, no shaft in unbroken perpendicular line has as yet exceeded the depth of 3280 ft. Taking each singly, the deepest shafts in the world at the present moment group themselves according to the following order:

1. The already mentioned Adalbert shaft, 3280 ft. deep. As the top of this shaft is 1732 ft. above the sea level, the bottom is, of course, 1548 ft. below it.

2. Two shafts near Gilly, in Belgium, are sunk to the depth of 2847 ft. At this depth they were both connected by a horizontal drift, from there an exploring shaft is sunk to a further depth of 666 ft., and from there again a trial hole 49 ft. in depth is put down, so that the total depth reached is 3542 ft. As they did not in the bore hole discover the sought for coal seam, they have returned to the shaft at the 2847 ft. level.

3. The Eimgkerts shaft of the Luganer Coal Mining Company, Rhenania, Lugau, in the Kingdom of Saxony, is 2653 ft. deep.

4. The Sampson shaft of the Oberhartz Lead and Silver Mining Works, near St. Andreasberg, Hanover, has a depth of 2437 ft.; is at present the deepest shaft of the Prussian mining.

5. The winding shaft of the Rosebridge Colliery, near Wigan, Lancashire, England, has a depth of 2458 ft. Coal is drawn from the "hanging on" at the 2418 ft. level; the time of the cage running this distance being 55 seconds, the winding rope has, therefore, an average speed of 44 ft. per second.

6. A shaft at the coal mines of St. Luke, near St. Chaumont, in the Loire department, France, reaches 2253 ft.

7. The shaft of the Dunkirk Colliery, near Dunkinfield, Lancashire, is 2069 ft. deep, but the mining is prosecuted to a further depth of 755 ft. by shafts from the lower levels, making a total depth of the mine of 2824 ft.

8. The deepest shaft of the collieries near Ronchamp, in France, is 1881 ft. A similar depth has been reached by the argentiferous mine near Kongsberg, in Norway. The mines belonging to the Roros Copper Works, in Norway, have worked to the depth of from 2540 ft. to 4270 ft.

9. The Amalia shaft in the mine works near Schemnitz, in Hungary, 1782 ft.

10. The No. 1 Camphausen shaft, near Fishback, in the department of the Saarbruck Collieries, has now reached the depth of 1650 ft., and may possibly become the deepest shaft in Prussian coal mining.

Although the depths to which the shafts enumerated have penetrated into the interior of the earth in the art and practice of mining, may appear mighty, and may be an expressive witness of the great progress made in mining pursuits, yet, on the other hand, the above results may be considered insignificantly small when we compare them with the extent of the earth's crust and the diameter of the earth. The deepest bore hole in the world is the artesian spring at Potsdam, in Missouri, which reaches a depth of 5500 ft.

Heat.—In continuing his lectures at the Royal Institution, Prof. Tyndall, with the aid of the thermo-electric pile and the galvanometer, illustrated the consumption of heat in the conversion of crystals into a solution, salt consuming more heat in the process than sugar, and saltpeter more than common salt. This illustration was continued with alcohol and ether, showing the consumption of heat in the vaporization of liquid. Water placed under the air pump in company with sulphuric acid, which consumed the vapor of the water, could be frozen in that way. A simple experiment of this kind was shown—a glass vessel containing water was connected by a tube with another glass vessel exhausted of air, and covered with a cloth wetted with salt and water; the vapor from the water passing into the empty vessel was condensed, and during the course of the lecture the water, thus deprived of its heat, became frozen. With reference to the heat produced and liberated in molecular processes, Prof. Tyndall stated that 8 lbs. of oxygen and 1 lb. of hydrogen, combining to form 9 lbs. of water, produced an amount of heat, which, expressed in mechanical force, would be sufficient to lift 47,000,000 pounds a foot above the earth's surface—in other words, its effect was equal to 47,000,000 foot-pounds. The first effect of the combination was to produce aqueous vapor, and in the passage of that vapor to water the amount of heat set free would be equal to the raising of 6,720,000 lbs. a foot above the earth's surface. In the passage of the 9 lbs. of water to ice, the heat liberated would be equal to 993,654 foot-pounds. In treating of the subject of liquefying gases, Prof. Tyndall produced snow from carbonic acid gas, and froze quicksilver in the process of melting the snow. In connection with this experiment, he referred to the deposition of snow upon the Alps by the rarefaction of the air blown from the plains of Lombardy; in the process of rarefaction work was done, in the doing of which heat was expended, and by the consequent reduction of temperature the moisture held in the air became condensed and fell as snow.

The Cotna locomotive was lately tested on the New York and New England Railroad, and the results are considered highly favorable. Under the new system of combustion there is no escape of smoke or cinders from the smoke-stack, and greater power is claimed to be evolved under the same conditions than by locomotives now in use.

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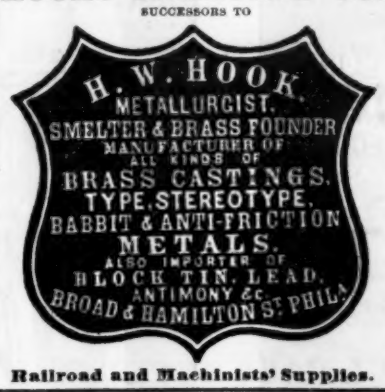

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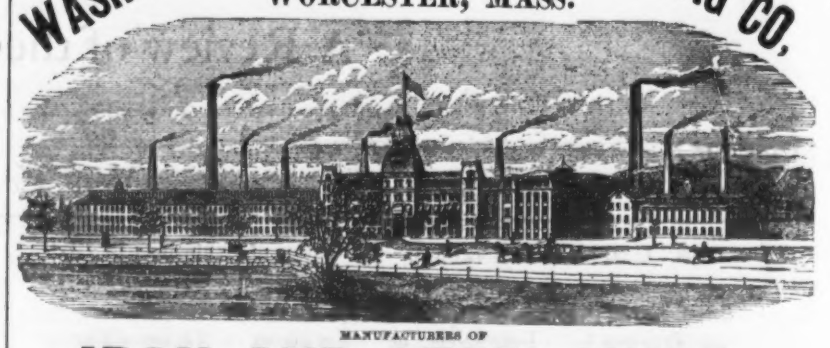

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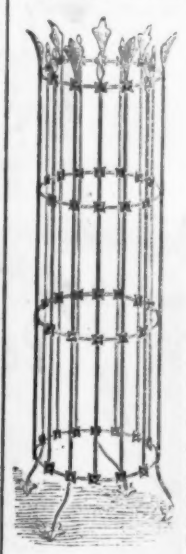

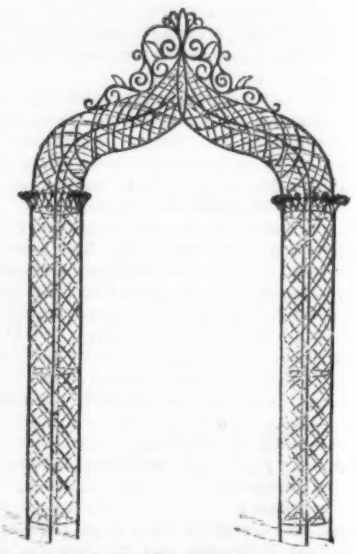

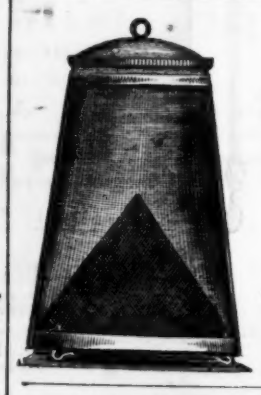

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Work by Contract.

We commend to the thoughtful consideration of our readers to whom the subject of work by contract is of interest, the following article from the Milwaukee *Sentinel:*

In the competition for work to be done by contract there are two other classes of bidders—one that bids with dishonest intentions, calculating in making up the bid the item of "scamping the job," and one that bids in ignorance of the nature of the work for which the bids are offered. A bidder of this last class may be seen hanging around the office of the architect, or wherever the contractors may be engaged in figuring the job, picking up such information as he can to make his bid upon. Thus it will be seen how often it happens that contracts are let below cost—that is, if the cost of actually fulfilling the demands of the specifications is computed. Now comes the rub. The successful bidder becomes the contractor, either through a mistake or dishonest intentions. The effect is much the same upon the building in either case. Satisfied that the work has been undertaken too low it is slighted at every point possible. The owner, in case of private work, is often his own superintendent. He is satisfied, through ignorance, with the work as it proceeds, but awakes to unpleasant discoveries during a storm when the rain comes through the ceiling, the winds undulate the carpets, and the perfume of drains permeate the parlors. Then we hear the outcry against dishonest contractors, and, unfortunately for the class, the charge has good foundation.

It sometimes occurs that a contractor will perform his contract honestly, even with the knowledge that he is losing money; this is the case much oftener than the public will give him credit for. It will not require a professor of political economy to understand that this course cannot long be continued. To pay out more than is received would soon result in the man being no longer a contractor.

On the other hand, an owner of a building cannot, as a rule, get more than he pays for. To educate the public conscience to a higher standard of value received than it at present knows, would soon do away with the charge of "dishonest contractors." We get, and can only get, what we pay for. Within the past few years contracts have been frequently let—perhaps it will not be saying too much, that they have been usually let—at less than cost; that is, if the specifications were strictly fulfilled. This applies to both public and private work, and necessarily implies the general bankruptcy of contractors, or a general slighting of the work. Contractors of over twenty-five years' practice in their business, and still actively engaged in it, in this city, who have the reputation of uniformly performing contracts with the utmost fidelity, have been in these last few years almost unable to obtain a contract either public or private. Private work alone was possible for the faithful contractor, and that only when the owner or the agent took proper means to bar out the dishonest and incapable bidders. The consequences of this method of undervaluation are plain enough to be seen. The work is improperly done to enable the contractor to get through with as little loss as possible. One of the worst features of this method is the nonchalance with which contractors generally come to treat it. "He got what he paid for," is the usual remark among them; and this is true, but none the less unfortunate. Their curt, rough, outspoken remarks contain the germ of the whole truth. Every cheap and flimsy house bears witness to it. The manifold imperfections in both the plans and specifications multiply in the construction of the building. Cheap plans are first sought, then cheap contractors; the result is a cheap house. The cheapening system prepares the way for slighted work. The one follows the other as night follows day. Those making the demand, however, are, strangely enough, disappointed. They expected to get more than they paid for. They have only been buying a house of Peter Funk, that is all; but again comes the outcry against "dishonest contractors."

A conversation heard while riding in the street cars not long since, would seem to answer this question:

"How much did your house cost?"

The sum was named.

"That's very cheap, is it not?"

"Oh, yes (smiling), that fellow lost money by my house. It *is* a cheap house—very cheap, sir."

The possessor of that cheap house—and it is a cheap house—chuckles, and wraps his warm overcoat around him with a sense of supreme satisfaction, while "that fellow" who "lost money by my (his) house" wears a coat too thin for comfort. The man so pleased with himself for over-reaching is living in a house, and calls it "my house," that was built by subscription—the workingman subscribing muscle, the merchant material. "That fellow" is digging away at another cheap house, slighting it all he can, trying to scrimp enough out of it to pay for the material that went into the "very cheap house, sir."

The too common practice of bringing into competition with this class of contractors those who are known to habitually slight their work, although capable of doing good work, and those who have neither experience nor ability, incapable under any circumstances of performing good work, has a tendency to lower the character of contractors generally, and deteriorate the standard of good work. Every man in the building business who has been a resident of this city twenty years and upward well knows the inferior manner in which work on buildings assumed to be first-class is to-day performed compared to that which they saw done in years past. No other men lament the decline in good, substantial work so much as they, for no other class of men so well understand the general deteriorating influences. And yet these very men must perforce adopt the methods in vogue, or get out of the way. In Rome one must do as the Romans do, is true in this case. A contractor who relies entirely upon making a living by doing good, honest work will starve in less than a year. The men who are willing to pay for such work are few and far between, and these few are not always building. Therefore all must fall into line unless some other occupation offers by which a living can be made; and but few contractors know any other way than the one which has been a life-work with them. They must make the best of their own business, whatever be the consequences. One of the strongest influences at work in extending the worst features of the present system of contracting in the building business is the natural aptitude of people to compare the cost of two buildings by their relative size. The average man who pays for a house measures its value by the number of stories and the superficial feet of ground it covers. To him a house is a house. There are big houses and little houses. John Smith's is as large as mine, and it only cost so much. An architect and builder knows what this talk means, and down goes the character of the house in accord with John Smith's house. After that no house in the city of the same size must cost any more—all the better if a little less. The character of the work is thus fixed by the cost. Houses are like men: it is easier to lower the character of either than to raise it. It is not certain but that the elevation or depression of the one will be correspondingly accompanied by the other. The general notion held as to the character of the average contractor would seem to sustain this idea; for that a general depression in the character of the work on buildings has taken place is true, whatever may be assigned as the cause.

A Curious Clock.

The Clockmakers' Company, of London, have recently printed a catalogue of the books, manuscripts, paintings and prints relating to horology, together with the collection of ancient clocks, watches and watch works, preserved in their library and museum. These are now deposited in the Guildhall Free Library. The list, compiled by Mr. W. H. Overall, is a foundation for a bibliography of horology. Among the prints is one representing a very extraordinary clock, the production of Jacob Lovelace, of Exeter. It took thirty four years to complete the work; he died in 1716. The movements are: First.—A moving panorama descriptive of day and night; day is represented by Apollo in his car, drawn by four spirited coursers, accompanied by the twelve hours, and Diana in her car, drawn by stags, attended by the twelve hours, represents night. Second.—Two gilt figures in Roman costume, who turn their heads and salute with their swords as the panorama revolves, and also move in the same manner while the bells are ringing. Third.—A perpetual almanac, showing the day of the month on a semi-circular plate, the index returning to the first day of every month on the close of each month, without alteration, even in leap years, regulated only once in 130 years. Fourth.—A circle, the index of which shows the day of the week, with its appropriate planet. Fifth.—A perpetual almanac, showing the days of the month, week and the equation of time. Sixth.—A circle showing the leap-year, the index revolving only once in four years. Seventh.—A timepiece that strikes the hour and chimes the quarter, on the face of which the whole of the twenty-four hours are shown and regulated. Within this circle the sun is seen in his course, with the time of rising and setting by a horizon receding or advancing as the days lengthen or shorten; and under is seen the moon, showing her different quarters, phases, age, &c. Eighth.—Two female figures, one on each side of the dial plate, representing Fame and Terpsichore, who move in time when the organ plays. Ninth.—A movement regulating the clock as a repeater to strike or be silent. Tenth.—Saturn, the god of time, who beats in movement when the organ plays. Eleventh.—A circle on the face shows the names of the ten celebrated ancient tunes played by the organ in the interior of the cabinet every four hours. Twelfth.—A belfry with six ringers, who ring a merry peal *ad libitum*. The interior of this part of the cabinet is ornamented with beautiful paintings representing some of the principal ancient buildings of the city of Exeter. Thirteenth.—Connected with the organ there is a bird organ, which plays when required.

Another invention pertaining to electricity, quite as wonderful as the telephone, though, perhaps, less calculated to attract popular notice, has recently been secured by patent in the United States to a Swedish inventor. The apparatus is an automatic Railway signal, which enables the station officials to know the precise position of any train at any time. It gives sound signals to the engineer, and at the station before the train enters, thus enabling switches to be cleared and arranged in time to prevent accident. If two trains approach each other, whether running in the same or opposite directions, the engineers of both the trains receive signals in time to prevent collision, and the station people are at the same time automatically informed of the position of both trains. Any train may, by stopping at certain points of the road where "contacts" are arranged, open telegraphic communication with the stations at both ends of the route, and two trains may in the same manner telegraph to each other. A complete record is automatically kept at each station of the spede of each train, and of the exact time it enters or leaves the station. Stop signals may be sent at any time from the stations to any train while moving. The apparatus may be arranged to send stop or danger signals to trains approaching swinging bridges which are not properly locked and fastened.

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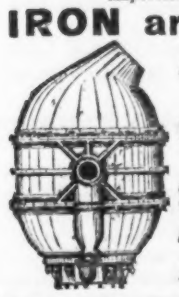
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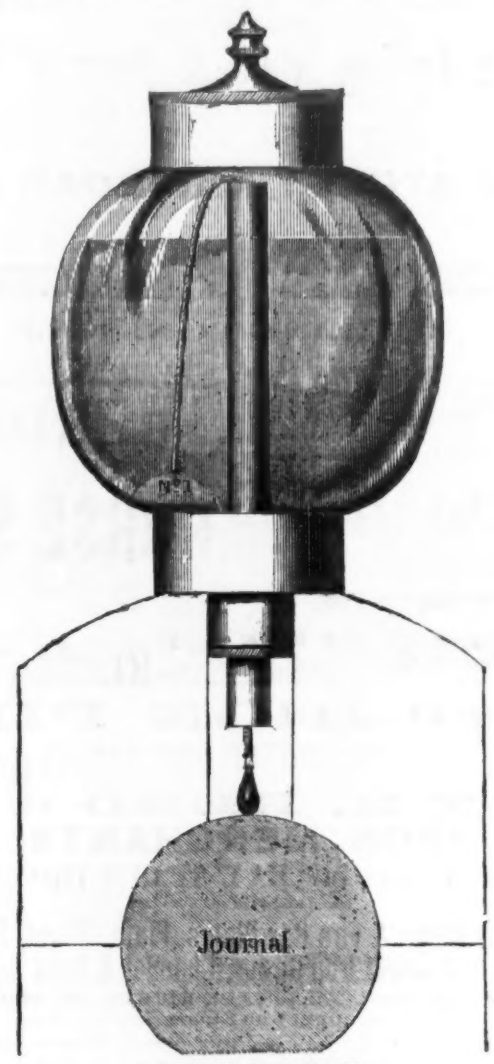
The American Oil Feeder.

We show herewith a device known as the American oil feeder, manufactured by Mr. J. B. Wickersham, No. 913 Cherry street, Philadelphia, which is regarded with much favor in a number of prominent manufacturing establishments where it is in use. The main feature of the invention is the feeder, which consists of one or more wires surrounded by a covering of fibrous material, as the accompanying plate will show. The different sizes of feeders will meet all ordinary requirements. As will be seen, the feeder is siphon shaped, with the end of the wick of the long arm resting a short distance above the journal, in order to let the oil drop free, otherwise it might become clogged with dirt from the shaft. The fibrous covering of the wires acts by capillary attraction, draws the oil from the cup and allows it to flow down upon the bearing, thus acting as a filter and feed combined.

The amount of oil supplied is very easily regulated by the capacity of the feeders used, which are of various sizes, and can be changed in a moment. The flow of oil is kept up while the machinery is at rest, but this merely insures sufficient lubrication to overcome the friction of starting, and there is no noticeable waste from this cause.

The American feeder probably reaches the limit of economy, as it will furnish just enough oil for lubrication. Mr. Wickersham claims a



THE AMERICAN OIL FEEDER.

saving of 75 to 95 per cent., making the cost of its use on a 2½ inch journal making 120 revolutions per minute but one cent for five months, and this with oil at 50 cents per gallon; if filtered crude petroleum is used at 30 cents per gallon, as at the *Public Ledger* office, Philadelphia, the cost will be still less. It is also claimed that the feeders are not liable to gum, as the wires at the center confine the capillary action to the surface and prevent the collection of sediment, which frequently occurs in ordinary cotton wicks or woolen yarns.

If the feeder should in time need to be replaced, it can be done at a trifling expense. The cups are made of various designs, of brass, glass and white metal or combinations. Where used for cranks, loose pulleys, &c., and pieces having motion, there is an adjustable bonnet which covers the upper end of the stem, and by being screwed up or down, opens or shuts the slot through which the feeder runs, and increases or diminishes the flow of oil, as may be required.

These oil cups and feeders were awarded medals at the Centennial, the Franklin Institute Exhibition of 1874, and the American Institute of 1869, and several hundred have been ordered for the Permanent Exhibition building, Philadelphia. They are now in use at the works of Wm. Sellers & Co., Henry Disston & Sons, of Philadelphia, the American Twist Drill Co., of Massachusetts, and many other places where they give entire satisfaction.

Mr. Wickersham is also the maker of several other styles of oil cups, all of which can be regulated by simple appliances so as to secure a proper feed, and are more or less popular with our different manufacturers.

Granite Railways.—A French engineer has proposed to establish tramways with granite tracks in lieu of rails, in Finisterre. He is of opinion that this system is far preferable to the ordinary railroads. There already exists a vast network of what are in truth tramways with granite rails, worked by horse traction, in Northern Italy. In the streets of the principal towns, and sometimes on the roads, tracks of granite are laid in the highways. The surface of these tracks being flat and perfectly smooth, the wheels of the vehicles glide over them with the least possible friction. The conductor of each vehicle takes care so to guide it that the wheels always remain on the granite. The author of the project maintains that there is nothing to prevent the granite lines from being used by carriages driven by steam-power, in like manner as though drawn by horses. At the same time it is not proposed to adopt the train system on granite tracks; each carriage will be provided with its own steam-power, will move by itself, and be guided by means of a mechanism specially devised for the purpose.

American vs. Clyde Shipbuilding.

The Birmingham *Post's* New York correspondent writes: Driven from this country as a market for so many of her manufactures, and defeated even in her own colonies by her American industrial rivals, it was still expected that in the grand art of iron shipbuilding England would for many years maintain the supremacy which is now universally conceded to her. But even in this it appears she is doomed to defeat, as she was in the construction of wooden ships, which, we are told, is now a lost art in England. This important fact was not generally known until it was made public the other day in a statement put forth at the instance of the iron shipbuilders of the United States, and the surprise its announcement at first excited has subdued into credulous satisfaction. On the part of the iron shipbuilders of Pennsylvania and Delaware—four companies—it is affirmed that iron ships are at this moment being built better and cheaper here than on the Clyde. It is claimed that little or nothing is known in England of the progress of iron shipbuilding in this country. The business may be said to be in its infancy; it began in 1868, and since that time, according to a statement given by the Register of the Treasury, there have been built in the United States for American owners 251 iron vessels of all sizes, having a total tonnage of 197,500. Two of these were over 5000 tons; eight from 3000 to 4000 tons; nine from 2000 to 3000 tons, and sixty-one from 1000 to 2000 tons; the rest varied from 100 to 1000 tons. The yearly reports show that the annual aggregate of iron vessels now built in the United States is over 30, valued at $12,000,000 to $15,000,000, and the business is every year increasing. So that the intimation in the circular of Brown & Co., that there are no iron shipbuilders in this country, is certainly without foundation. The firm of John Roach & Sons alone claim to have constructed more iron ships within the last five years than any builder in England. Since 1872, when they began to build iron ships, they have built 33 iron steamers (inclusive of those now under contract), having a total tonnage of 68,150, and in that time they have paid out for materials and labor the large sum of nearly $15,000,000. As regards the cost of building iron vessels, five years ago the cheapness of her raw materials and labor, and the possession of all the facilities for building an iron ship, gave England the superiority that she still retains. In this country the facilities were very imperfect; pig iron was $45 per ton, coal and labor were high, and copper was cheaper in England than here. But now, says the statement: "Under the protection of the laws of the United States, the American builders have been enabled, in the first place, to create the facilities for building an iron ship rapidly, easily and cheaply." They have put up rolling mills in their yards, as well as furnaces and shops, and a large quantity of excellent labor-saving machinery, much of which is exclusively of American invention, and not used in other countries. The facilities for carrying on the business are, in fact, so complete that Mr. Laird, who visited this country last year, was astonished at them, and was constrained to admit that the industry in the United States had made extraordinary progress. Then the prices of raw materials have been reduced. About 2000 tons of iron enter into the composition of a 3000 ton ship, and every $5 in the cost of pig iron per ton makes, therefore, a difference of about $10,000 in the cost of a vessel. Formerly it was hopeless to compete with England in the manufacture of anything of which iron was the chief component. She had the only cheap metal in the world, and pig iron in the United States ranged from $45 to $70 per ton. But so rapid has been the development of the iron manufacture in the United States that pig iron to shipbuilders has fallen to $18 per ton; the importations of iron have fallen from 800,000 tons to an insignificant figure, and to-day iron is as cheap in the United States as in any country in the world. But the great item of expense in building a ship is labor; in the cost of a steamer it constitutes full 60 per cent. This item has been cheapened to American builders in two ways. First, they dispense with a very large amount of it by the use of labor-saving machinery, which the English do not employ; and, next, the price of labor has been more nearly equalized in the two countries. Mr. Laird, when here, admitted that with the appliances in use in American shipyards it might be possible, all other things being the same, for Americans to produce as cheap a ship as the English, and even pay the men better wages. As for copper, the price of that metal has declined so far that the United States exports it; and, as regards wood, it is hardly necessary to refer to that at all. Thus it would seem that through the equalization of the prices of labor, the cheapening of raw materials, and the creation of facilities, the American iron shipbuilder is in every respect the equal of his foreign competitors, and he now claims to be able to construct a ship as cheap as it can be done anywhere in the world. Indeed, the American builders do not hesitate to declare their ability to turn out an iron ship cheaper than the English can, for the reasons that wood, which so largely enters into the composition of an iron vessel, costs so much less here, and American machinists construct the most efficient and economical engines in the world. According to Brown & Co.'s circular, the price of iron sailing ships on the Clyde is from £13. 10/ to £14 per ton in gold. Mr. John Roach says that within the present year he will complete any number of iron sailing ships, from one to six, for the same price in currency and deliver them in an English port, provided he has the privilege of taking a cargo in them. He will also guarantee that when completed they will receive the best ratings from European or American insurance companies. With facts such as these on which to base an opinion, it is no wonder that sanguine people predict that at an early day the United States will recover the carrying trade lost since the war, and every one of the large Atlantic harbors of this country will no longer look like an English seaport. At present it is not easy to discover an American flag flying in one of them.

Stove Founding at Sing Sing Prison.

A correspondent of the Albany *Argus*, who has visited the foundry of Messrs. Perry & Co., at Sing Sing, writes as follows:

Your correspondent was shown through the male prison by a member of the stove firm of Perry & Co., of Albany. Exclusive of an immense foundry now in course of construction, the work of the firm named will occupy three of the prison buildings: One 200 feet in length, and two stories in hight, to be used as a tin-shop, blacksmith shop, general repairing establishment and for storing iron patterns; one 220 by 36 feet, and three stories high, and one 38 by 79 feet, and one story high. In the second building is a mounting room which can accommodate 300 hands. The nickel-plating and polishing departments started last week, and a number of hands are already employed there. The State has just about completed for Perry & Co. a foundry building 128 by 173 feet. The building has been erected exclusively by convict labor. It is expected that the new foundry will be in operation by June 1. A duplicate of this building will be erected adjoining, and the work is to proceed immediately. An immense foundry will be the result. It will accommodate 300 molders. This force of skilled help will entail the labor of 500 additional hands at subsidiary branches of the business. The equipments of the establishment are to be perfect. The unloading of boats for the foundry, as well as all heavy hoisting, is to be performed by steam. The molten iron will be transported from the cupola in "bull" ladles—a most efficient device upon wheels. The superiority of the plan consists in the fact that the energies of the men are not exhausted by conveying heavily loaded ladles, and they are always fresh for the business of pouring the metal into the flasks; better work than can be otherwise made results. The new foundry will have three cupolas. About five acres of ground are devoted to the purposes of Perry & Co. The firm pay no rent for the accommodations, their obligations to the state per convict amounting simply to the payment of 40 cents a day per man for the first year and 50 cents for the ensuing four. The aptitude of the convicts to learn is well illustrated by the fact that in one of the prison buildings are 25 convicts, who, without having learned the trade of molding regularly, are doing the work of molders for a firm styled Huyden & Co., whose articles of manufacture require the service of such mechanics. One instructor made valuable workmen of them in a very short time. In the three prisons of this State there are at present 35 first-class molders, who will be put to work for Perry & Co. upon the opening of the new foundry. At the beginning a number of molders from outside the prison walls will be employed. While the convicts who are not molders are learning to become such, they can perform all the heavy work for the skilled mechanics. It is estimated that the contract with Perry & Co. alone will pay a profit for 1877 of $75,000, and for 1878 of at least $120,000.

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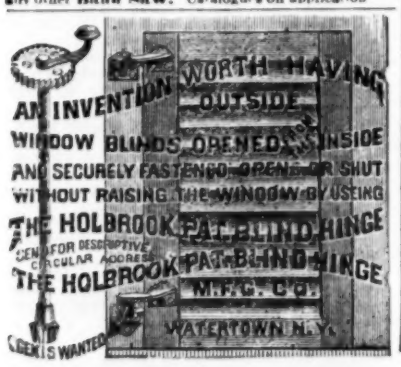

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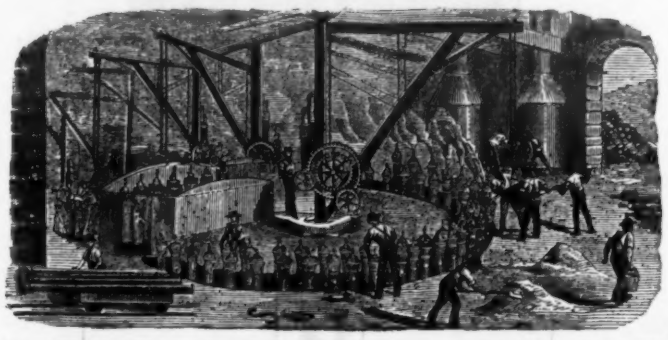

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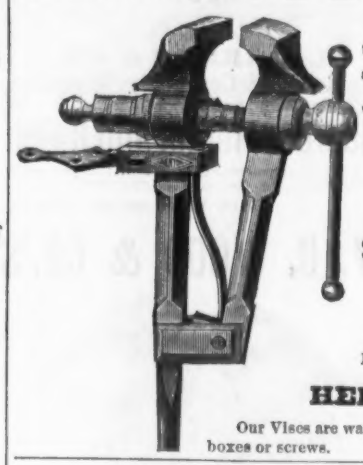

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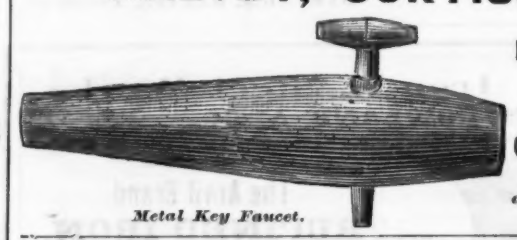

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Submarine Telegraph Apparatus.

With a view to obtain by the mere influence of the very feeble currents provided by submarine cables, contacts insuring the closing of the circuit of a local pile, and to apply the Morse system to submarine telegraphy, so as to obtain printed Morse signals instead of signals thrown by the mirror of Thomson's galvanometer, Count Emilio di Siccardi, of Turin, proposes to replace the ordinary mirror galvanometer into a relay galvanometer, the distinctive feature in which consists in the employment of mercury to establish the contact intended to close the circuit of the local pile. At the center of a circular plate of wood is mounted upon a copper foot a galvanometer bobbin. The wire in the bobbin is of very small diameter, and is twisted a sufficient number of turns upon the bobbin to obtain a resistance of from 3500 to 4000 Ohms. The current from the line passes through the spirals of the galvanometer, and then goes to earth. In the line of the axis of the bobbin and at the ends, are placed two bronze supports, the bases of which are adjusted in a groove of a cross piece, also of bronze. The supports slide with gentle friction in their grooves, so that their position can be regulated as desired. Each support carries an arm, in the opening of which is placed the moveable system of the apparatus. This system is composed essentially of a small axis of aluminium, with steel points pivoting between the platinum points of two screws. Upon this axis is fixed a very light magnetized needle, provided upon one of its ends with two sharpened platinum points. These points are situated opposite the extremity of a tube, also of platinum, electrically isolated from the metallic mass of the apparatus, and filled with mercury. It is between these platinum points and the little drop of mercury that the projection of the orifice of the tube occurs, which establishes the contact intended to close the circuit of the local pile. The tube is screwed into a support, which enables it to be easily brought into a convenient position.

The amplitude of the oscillations of the needle is limited by two screws with ivory points. The axis of each magnetized needle is crossed by a little rod of aluminium, bent into a right angle at its middle, and dipping by the flattened extremity of its vertical part into a silver cup filled with water. This arrangement is for the purpose of preventing any oscillation of the magnetized needle other than that provoked by the emission of a line current. Two permanent magnets, mounted upon heavy bronze feet, are placed on each side of the galvanometer. They are approached or separated at will. Each of them serves, firstly, to call back the neighboring needle to its original position after each deviation; secondly, to regulate the influence of the line current upon that needle; thirdly, to neutralize the influence of the terrestrial poles which do not fail to act upon the magnetized needles of the apparatus. When it is desired to use the apparatus, the supports are moved one toward the other, so as to introduce the two systems, pivoting from 15 to 20 millimeters in the interior of the bobbin. The latter must be sufficiently long that the needles thus approached toward one another may not be reciprocally influenced. The exterior magnets are suitably placed, so that their antagonistic force upon the magnetized needles may be in relation to the force of the line current. A pole of the local pile is then united with two isolated tubes, and the second pole with the metallic mass of the apparatus, and, consequently, with the two magnetized needles. These needles are placed so that their poles of contrary denominations are opposite to one another, so that under the influence of any line current they always deviate in opposite directions. It will now be understood that by the emission of a current in one direction one needle arrives into contact with the mercury, so as to close the local current, becoming a printing receiver, the other needle remaining in repose; by the emission in the contrary direction, the needle which has just made contact remains in repose, and the second needle closes in its turn the local circuit.

Originally, the local pile was arranged with two different circuits, each comprising a tube and an armature of a printing receiver; the two armatures acted independently, and inscribed one of the points to the right and the other to the left of the same band of paper; according to the direction of the line current, printed dispatches were thus printed in the same manner as they are read on the graduated scale of Thomson's galvanometer, but this system presents several difficulties in its application. It is well known that when several currents are sent successively through a submarine cable in the same direction, as must be done for certain letters, these currents gradually diminish in strength. It is known also that the Varley condensator preserves during these emissions, and up to the passage of an inverse current, a charge which prevents the mirror of the Thomson galvanometer from returning to zero. In the present apparatus these defects would be very injurious—firstly, because the successive currents in the same direction would become too feeble to produce the deviations of the needles; or, secondly, because under the permanent charge of the line resulting from their emission there would be produced an adherence of the needle to the mercury probably too strong to be overcome by the exterior magnets. To avoid these difficulties use is made of a manipulator sending the currents alternately in opposite directions, and which always closes the same local circuit. This manipulator has the general form of a "Morse" key, but differs from it by this addition: The touch or cross piece is provided with a catch acting upon a ratchet, upon the axis of which is placed an inverter. The latter is composed of three little copper wheels of the same diameter; the middle wheel communicates with the earth by a friction spring, and the lateral wheels with the metallic mass of the manipulator by two other friction springs. These wheels have an equal number of teeth at their circumference, the breadth of which is one-quarter of a turn. The teeth of the middle wheel have intervals separating the teeth of the lateral wheels. Two springs communicating each with a pole of the pile of the line, rub at the circumference of the three wheels. When the touch of the manipulator is lowered the inverter makes a half turn, and the friction springs put the one, a pole of the pile (zinc for example) in communication with the middle wheel—that is to say, with the earth—the other, the second pole of the pile, in communication with a lateral wheel—that is to say, with the metallic mass of the manipulator, and, consequently, with the line. When the touch is lowered again these effects are reversed. The currents of a same pile can then be sent on the line by reversing them continually, which avoids all remanent charges.

It will be now understood that it will be no longer possible to print dispatches so that they can be read in the same manner as those obtained upon the graduated scale of Thomson. It is also necessary to observe that upon submarine lines one absolutely cannot, as one can in aerial lines, obtain currents of a duration variable at will suitable for the impression of points or strokes as in a Morse receiver. It is for this reason that it becomes indispensable with the present instrument to make a little change in the Morse alphabet. The points of the alphabet are always represented by points spaced a certain amount (. . . . .), and the strokes by two points a little less separated (. . . . .). The slight inconveniences which may result from this new manipulation differing so little from that used up to the present time, will be largely compensated for by the advantages possessed henceforth of producing in submarine cables all the effects possible with a contact closing a local circuit. One could, for example, obtain translation, and, perhaps, even make use of the Hughes apparatus.

Railroad Engineering in Russia.

A Russian correspondent of the London *Daily News* says:

The railway from Kischneff to Yassi runs down the little valley of the Bulkhova, a little stream on which the former is built, and which empties into the Pruth at Ungheni. It is a pretty little valley enough, though it is just now nearly half submerged by the high waters caused by the continuous rains that have been falling almost steadily since the beginning of spring. The slopes on either side are not so steep and rugged as to prevent the ground from being tilled, but they are still uneven enough to give one a very different idea of Bessarabia from that usually entertained. These slopes are here and there relieved by villages, the houses of which, although straw-thatched for the most part, are nearly always whitewashed, and which, as seen from the railway, present a very neat and clean appearance. Each village has its church, which is built on the same general plan as all the Russian churches, nearly square, with whitewashed walls, and high round domes painted green, which replace spires of Western churches. It is a curious fact, not without its significance, and not without its influence on the Eastern question, that the plan of nearly all Russian churches is a modification when it is not an exact copy of that of St. Sophia at Constantinople. With the exception of the whitewashed walls and the dome painted green, which are so universal in Russia, one will see in almost any Russian village an almost exact copy in miniature of Constantine's great temple built 1400 years ago. Russia has received her religion and her civilization from Constantinople, and it is no more astonishing that Russia should become the champion of the Eastern Christians than that France should have become the protector of the Pope. It is not for nothing that Russian churches are built on the model of St. Sophia.

As we progress down the valley, the hills on the left grow larger and higher until near the Pruth they take the dimensions of low mountains, and they are here in part covered with forests, wherein wild boars and even bears find a secure refuge. Some eight or ten miles before reaching the Pruth the railway passes over a piece of ground about four miles in extent, which is the despair of the engineers of all countries, and which has hitherto set all the resources of engineering skill at defiance. Seen from above the country presents an irregular, broken appearance, with a number of low hills all jumbled together, among which the Bulkhova twists its way in short, tortuous windings. In carrying the railway through here it was necessary for several not very deep nor long cuttings and fillings to be made. The task seemed a slight one at first, but, slight as it seems, it is one which has hitherto baffled the skill of the most eminent engineers of Europe, nearly all of whom have had a look at the work. It was not that the cuttings and embankments were so difficult to make in the first instance. The trouble has been ever since they were made to keep them from filling up at every rain, and the embankments from running away like so much mortar at every shower. These low, irregular hills are composed of a kind of moving earth that has no more consistency or cohesion than a heap of buckshot, and almost as great an inclination to keep its level as a hodful of bricklayers' mortar. It is a loose kind of earth that absorbs water like a sponge, on a substratum of clay that is waterproof. The result is that the water is held, as it were, in solution on the surface earth, and that a slippery kind of paste is formed on the top of the clay, over which the low hills of thin equilibrium, if disturbed, as it is by these railway cuttings, come slipping down in a way that drives the engineers to despair. No matter how much earth they cart away, the very next rain that falls the hillside regularly slips down again, and buries the rails several feet deep beneath a mass of earth and mortar; the trains are stopped, and the work is all to be done over again. They have tried building heavy stone walls, but as the hills are coming down bodily the walls are carried with them, and are demolished and swept down and tumbled about in very mockery of the engineers. The only resources left them is to cart the earth away as fast as it comes down, and at the same time to widen the cuttings and obtain so slight an inclination that the earth cannot move. This, however, seems impossible. I saw one cutting that was not more than fifty feet deep, which had been widened at the top until it seemed a quarter of a mile wide, and until the inclination was barely fifteen degrees from the level, and yet with this slight inclination the earth was still moving down and covering up the railway. The engineers are still working on it, and carting it off. They have been working on it for five years; the company has already spent over 2,000,000 roubles on a piece of road not four miles long, and the worst of it is that they seem to be no nearer the end than when they began. There has been so much rain this spring that it would have been impossible to keep the road open for traffic had it not been for the necessities of the Russian government, which keep a large number of men employed in clearing the line and in keeping up the embankments, which sink down and run away with a facility that is only equaled by the hills themselves. The engineers will never be able to do anything with it, and the only means of solving the difficulty is by avoiding this piece of country altogether, carry the railway through a tunnel, and cross the Pruth some miles lower down.

American Locomotives in England.

Two months ago a locomotive was shipped from this country to England, and recent Hull papers comment on the fact with some wonder and some apprehension. It was a cheap engine, valued at less than $7000, but is the first export thither of this kind, and is quite likely to be used as a model for British imitation. In the fiscal year 1875 our exports of locomotives to North and South America, Russia, Turkey and Cuba were valued at nearly $1,000,000. They numbered 70, and were taken by nine several countries. Since 1870 we have shipped 400, valued at $5,500,000—the greatest numbers being 72 in 1872 and 79 in 1874, and as many the following year. The values ranged between $341,794 and $1,147,366, and, according to the London *Engineer*, they "are cheaper than English locomotives, do as much work and do it as well." In addition to the propelling power, this country now exports palace cars to England and the continent; has sent street passenger cars and large quantities of car wheels, and the American passenger railway car is running on some English and several European roads. Our freight car has found the same markets; and the cars having won their way for street and railway service, the recent assertion of the London *Engineer*, that at present rates a first-class American locomotive can be placed on an English road complete for $9000, when the best English cannot be bought under $12,000, would seem to show that our locomotive shops are able to equip English roads with better and stronger and faster engines than English works can. We are not advised whether the locomotive lately shipped is for service or as a model. The latter supposition is somewhat improbable, as the manufacture would require American mechanics, tools, appliances and perhaps American iron; it is more likely that British engine builders are losing the patronage of their own roads, and that the import of American locomotives has commenced. Whichever is the case, the success of this model can hardly fail to be followed by new orders, since neither in mowing, reaping, sowing nor in any other machinery have English mechanics succeeded in uniting the strength, beauty and speed of American models. Having superiority of this nature, and greater endurance, we may rationally hope to find a market in Great Britain this year for more machinery; and winning a share of that business, we may turn to the continent and anticipate the return of more interest bearing bonds. The beginning promises well for industry and commerce.—*Philadelphia North American.*

Transparency of Metals.—To see through a millstone or a brick wall has usually been regarded as a feat requiring for its accomplishment powers possessed by human beings only in a spiritualistic trance, or when otherwise rendered clairvoyant; and to see through a mass of metal is ordinarily regarded as equally impossible to human visual organs. It is true that it has long been known that gold leaf may be beaten so fine as to transmit a greenish light tolerably readily; and, indeed, this is used as a practical test of the quality of gold by the gold beater, the mixture of small quantities of silver with the gold employed causing a distinguishable alteration in the tint of the transmitted light. Hitherto, however, this property of translucency when in thin films has been regarded as peculiar to gold, and belonging to no other metal, the reason for this being no doubt, to some extent, that few metals other than gold can be successfully reduced by hammering to the requisite degree of tenuity; save silver and platinum, indeed no metals approach gold. By electrical means, however, thin films of gold and other metals can be obtained which readily transmit light, the mode of operating to produce these attenuated sheets of metal being simply to cause electric sparks to pass from wires of the required metals passing into tubes of rarefied air or other gases, when the particles of metal detached from the wires by the sparks become deposited on the sides of the glass, forming an excessively thin film, quite continuous under the microscope. Gold films thus prepared transmit a fine green light; silver gives a fine blue color; copper a dull green; platinum a bluish gray; zinc and cadmium a deep bluish gray; iron a nearly neutral tint, but slightly brownish.

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The American File Company have the exclusive right to use the Bernot process for cutting files. By this method all the advantages of hand cutting are secured, together with an accuracy unattainable in hand work. They are the only manufacturers who employ machinery for testing files and steel.

Goods of all known manufacturers have been repeatedly tested, and interesting tables have been compiled showing the working qualities of files made by different makers, and of files made from different steels, and with various shapes and angles of tooth. They have thus reduced the manufacture of files to an exactness and perfection with a uniformity of result, as they believe, never before attained. No file, foreign or domestic, that they have ever tested, has equalled the performances of their own goods taken at random from their stock. Their machines are capable of the most delicate adjustment, and can produce the very finest work known to the trade. Special files made to order. Prominent file manufacturers are having their best goods from our works.

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McCaffrey's Philadelphia Hand Cut Files and Rasps

Have Proved their Great Superiority.

Silver Medal. Highest Premium.

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HORSE RASPS AND FILES.

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We invite the attention of the trade to our Celebrated American Horse Rasps and Files, made from the very best American Steel all cut by hand, and warranted to give entire satisfaction. All Rasps and Files not stamped as the annexed incorporated trade mark are not genuine. Sold by Hardware dealers generally.

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FILES & RASPS,

Best Cast Steel.

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AUBURN FILE WORKS,

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FILES AND RASPS,

MADE FROM IMPORTED STEEL. EVERY FILE WARRANTED.

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HAND-CUT FILES and RASPS,

Made from English Cast Steel.

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Manufacturers of SUPERIOR

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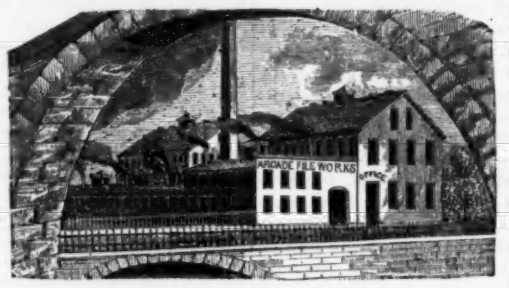

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Quality guaranteed by written warranty when required.

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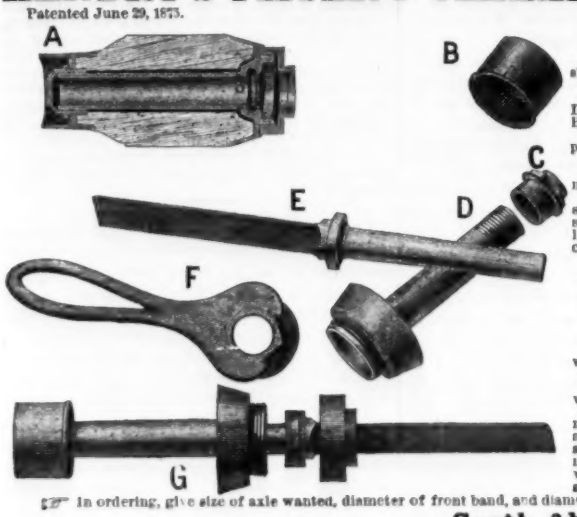

DESCRIPTION,

A, Section of hub complete, showing oil-chamber o.
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C, Nut which screws on to box D, and confines box D and band B to the hub.
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No oil can come in contact with the wood of the hub.
No oil can escape.
No dirt, gravel or water can work.
It holds the wheel in a superior manner. It is easier to oil than a common axle. It is adapted to any kind of a wheel. It requires no wedging to box the wheel. It will run **500 to 1000 miles at a single oiling.**

☞ In ordering, give size of axle wanted, diameter of front band, and diameter of hub.

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Non-Extensible Razor Belt.

PATENTED JULY 25, 1871.

RE-ISSUED MAY 13, 1873, and JUNE 9, 1874.

In this Strap the liability of the leather to stretch and become loose and porous is prevented by the use of a patented non-extensible base, which supports the leather and secures

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We make this style with single rod, double rod, and wood frames, and intend that it shall, in quality compare favorably with our other well known brands.

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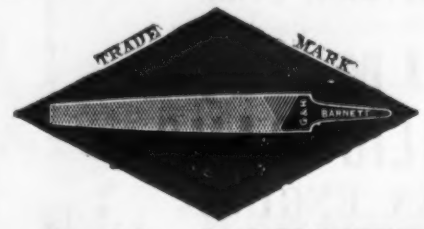

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POLISHED OR BLUED.

HAMMERED AND FINISHED

The Ausable Nails

Are Hammered Hot,

And the Finishing and Pointing are Done Cold,

Thus Imitating the Process of Making Nails by Hand.

Quality is **Fully Guaranteed.**

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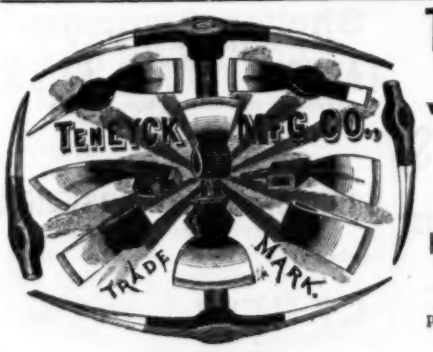

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AXES

Of all kinds.

Hatchets, Adzes, Grub Hoes, Mattocks and Picks.

Catalogues and Price Lists furnished upon application.

Prof. Akerman and the Henderson Process.

NEW YORK, June 11, 1877.

To the Editor of The Iron Age.—DEAR SIR: I find in the *Bulletin of the American Iron and Steel Association* the following:

"A communication, addressed to us by Prof. Richard Akerman, of Stockholm, Sweden, dated May 10th, says: 'As Mr. James Henderson, of New York, in the *Bulletin of the American Iron and Steel Association* for this year, No. 13, claims that his process is used by the Fagersta Steel Company, of Sweden, I herewith take liberty to inform you that this is not at all the fact. His process neither is nor has ever been used there, and I dare say that it never has been used anywhere in Sweden.'"

It is evident that the process referred to by Prof. Akerman is not the same as that refered to in the *Bulletin*. What is generally known as my process is the Fluorine process, which consists of the use of fluorine with oxygen, and removes phosphorus and all other impurities from cast iron. This was patented in 1870, and, as Prof. Akerman says, has probably never been used by the Fagersta Company or elsewhere in Sweden.

I think he may not know that I have a patent for the process of using manganese in preparing the cast iron before it is used in [the Bessemer process, as distinguished from Mushet's process of applying it at the end of the Bessemer process, and may have got the idea that my fluorine process is the only one that bears my name.

You remember that I showed you, a few weeks ago, a letter from Prof. Akerman to Mr. A. L. Holley, respecting the publication, in Sweden, if any, prior to the time my invention was made, in 1865, of the manganese process. The purport of this letter is that up to that time there had been no such publication. There was a brief notice in a pamphlet of some experiments with the manganese which gave no special result, except that the Bessemer worked a little hotter in consequence. Prof. Akerman, as Swedish commissioner at the late Exhibition, issued a pamphlet descriptive of the Fagersta steel and the ores used, and the manner which it is shown that the process employed in making the Fagersta steel is substantially the same as my process, patented in 1865. Yours, truly, JAMES HENDERSON.

Ferro-Chromium Steel.

In producing Bessemer steel, the usual charge of pig iron—7 tons—is placed in a cupola furnace, and when this metal has been decarbonized by the process now well understood, there is a waste of about one ton of iron, and six tons are consequently left to be recarbonized or converted into steel. The invention of Mr. Julius Baur of Brooklyn, N. Y., consists in adding ferro-chromio-manganium, obtained by direct reduction in the cupola furnace of chrome ore in combination with spiegeleisen, or an iron rich in combined carbon and manganese. The amount of spiegeleisen or ferro-manganese required depends upon the character and grade of steel to be produced.

The spiegeleisen is generally melted in a cupola furnace, and Mr. Baur proposes before it is charged in to take about 300 lbs. of finely ground chrome ore, 40 lbs. of crushed anthracite, coke, gas graphite, or other refactory carbon of about the size of peas, 20 lbs. of ground borax and 15 lbs. of sand mixed well together. He then spreads out the whole, and makes some free space in the middle of the mass, and puts about 20 lbs. of fresh burned lime into it; he then adds water to the lime, and when it is well hydrated he mixes the whole together like mortar and forms it into balls or bricks, and then dries them. Instead, however, of thus preparing the chrome ore, a similar result may be obtained by mixing it with borax and tar or pitch; in this case the borax should be burned and pulverized, and the tar or pitch lequefied by heat. The whole is well mixed, and when cold the mass is broken up and used; the proportion of borax to the chrome ore is similar to that just described. The cupola is then to be charged with a great amount of fuel, preferably coke, and on the top of the fuel the balls or bricks are placed; on the top of the so prepared chrome ore another layer of about 1 to 1½ ft. or more of coke is charged, and on the top of this the spiegeleisen or ferro-manganese is placed. When the whole charge is melted down he adds the metal to the decarbonized iron and proceeds as usual.

The points of importance for the success of the operation are: First, a heavy charge of fuel; second, the use of a borax flux; and, third, the presence of spiegeleisen or an iron which is rich in combined carbon and manganese on top of the prepared chrome ore. The spiegeleisen or ferro-manganese assists the liquefaction of the reduced chrome ore and prevents its oxidation, and without it no satisfactory result can be obtained. To produce a medium grade of steel he takes to the 7 tons of iron about 300 lbs. of chrome ore prepared as described, and about 1120 lbs. of spiegeleisen or ferro-manganese rich in carbon and manganese. The amount of prepared chrome ore used may vary, but should not be less than about 100 lbs. and not more than about 600 lbs. of chrome ore to 7 tons of pig iron. The degree of hardness of the steel is regulated by the amount of spiegeleisen added to the decarbonized metal, the chrome acting to impart toughness and tenacity to the steel. Practical experience has shown good results by proceeding in the way described.

Five Days in a French Mine.—A fall of coal occurred in a pit of Roche-la-Moliere, near Saint Etienne (Loire), on the 8th ult., by which three workmen, Brossard and the two brothers Peyron, were cut off from all communication with the surface. As hopes were entertained that they were only imprisoned, and not crushed, gangs of men were at once organized to liberate them, and those efforts happily proved successful, after the poor men had passed 125 hours in their subterranean prison. They were alive, but in a very exhausted state. The account they have been able to give is to the effect that, when the accident happened, they were in a sort of chamber which protected them from being hurt. They possessed the provisions they had brought for their day's consumption, and three liters of wine. Those precious articles they partook of with most frugal parsimony, but at last all was exhausted. They had the good fortune to discover a spring of pure water, to which in all probability they owed their lives. Brossard had saved his lamp, and for two days they had some light, but the oil gradually diminished, and they then were plunged in complete darkness. The accident having been accompanied by an inundation of the lower part of the mine, the men suffered severely from damp and cold, but bravely kept up their spirits. The elder Peyron cheered his comrades by relating how he had himself formerly been in a similar strait, but had been liberated after a period of three days. His efforts were powerfully aided by the fact that they could hear the constant blows of the men outside straining every nerve to release them, and they all agreed that they never despaired of being eventually saved. However, their powers of endurance were taxed to the utmost limits. When the pangs of hunger became unendurable, they ate their tobacco, gnawed lumps of wood, &c.; but at length, finding themselves growing weaker, they managed to arrange a bed of coal dust, on which they lay down, and where they were found by their deliverers, one of them being even asleep.

The Pennsylvania Railroad Wages Reduction.—At a meeting of representative engineers from the Pennsylvania Railroad and its branches to consider the 10 per cent. reduction of their wages, which went into effect on the 1st inst., a committee of twenty was appointed to call on Col. Scott in relation to the matter. The committee had an audience with Col. Scott, and he explained to them that the reduction was general, and had no other significance than a desire on the part of the company to retrench expenses and economize. The committee reported the result of their interview to their comrades, and it was decided to accept the reduction and appoint a committee to so inform Col. Scott. "Striking" is not very profitable in these days, in these or any other parts of the country. There are too many men out of employment at this time for any body of laborers or employes to embarrass employers by striking. Their places can easily be filled, and the officials of the railroad were prepared to put new laborers to work at once, had not the strikers thought better of their opportunity, and repented their foolish and rash action in time to save themselves from being thrown out of employment altogether. Sober second-thought is better than hasty impulse, which is so often followed by misery and remorse.

Philadelphia's Export Trade.—The *Ledger* says: The exports from Philadelphia to foreign ports during May amounted in value to $3,188,222, of which about one-third were carried out in American vessels. Usually the monthly table of exports shows that American vessels carry out more goods from Philadelphia than foreign vessels, but recently this port has had such advantages in shipment that it has been attracting for the return voyage vessels of all flags that may have come into other Atlantic ports with cargoes from abroad. Hence, excepting in shipments to England and her colonies, to Cuba, Venezuela, Brazil and Japan, the foreign vessels during May did the most of our transportation. England did not take as much of our exports as usual during May, her total being something over one-third of the whole, $1,262,000, while Ireland took $618,000. To Belgium we sent $348,000, all in foreign vessels; to Germany, $240,000, also all in foreign vessels; to Italy, $165,000, foreigners carrying the whole of this shipment also, as well as that to France, which took $96,000. American vessels, on the other hand, carried the entire exports sent to Brazil, Venezuela and Japan. The chief articles exported were over $900,000 of breadstuffs, 775,000 of petroleum and its products, $825,000 of provisions, $180,000 of cotton and its manufactures, and $126,000 of tallow. Iron manufactures exported amounted to the large figure of $70,000, while we also sent to foreign ports 5844 tons of coal, a trade that seems to be slowly, though steadily, growing. There were two and a quarter millions of pounds of fresh beef, beside $10,000 worth of living animals sent abroad from this port during May.

Strength of Iron Plates.—The London *Iron and Coal Trades Review* says: Some experiments have been recently carried out in America with samples cut from an iron plate, with the view of deducing a law for the difference in the strength of iron when taken parallel, and when taken at right angles to the revolutions of the rails. Mr. C. Graham Smith, of the Dockyard, Liverpool, communicating with a contemporary on this subject, says that English iron, as, for instance, Staffordshire and North Country plates, unquestionably have a greater tensile strength in the direction of their length than across it. As experience leads him to believe that this result can be much modified in the processes of manufacture, and taking advantage of the present depressed state of the iron trade, he would have no hesitation, if necessary and desirable, and had he a large order to place, in specifying for Cleveland plates to stand a tensile strain of 19 or 20 tons per square inch, and elongate about 5 per cent. before breaking, both with the length of the plate and across it, without fear of enhancing the price of the iron,

RUSSELL & ERWIN MANUFACTURING COMPANY

Manufacturers of HARDWARE.

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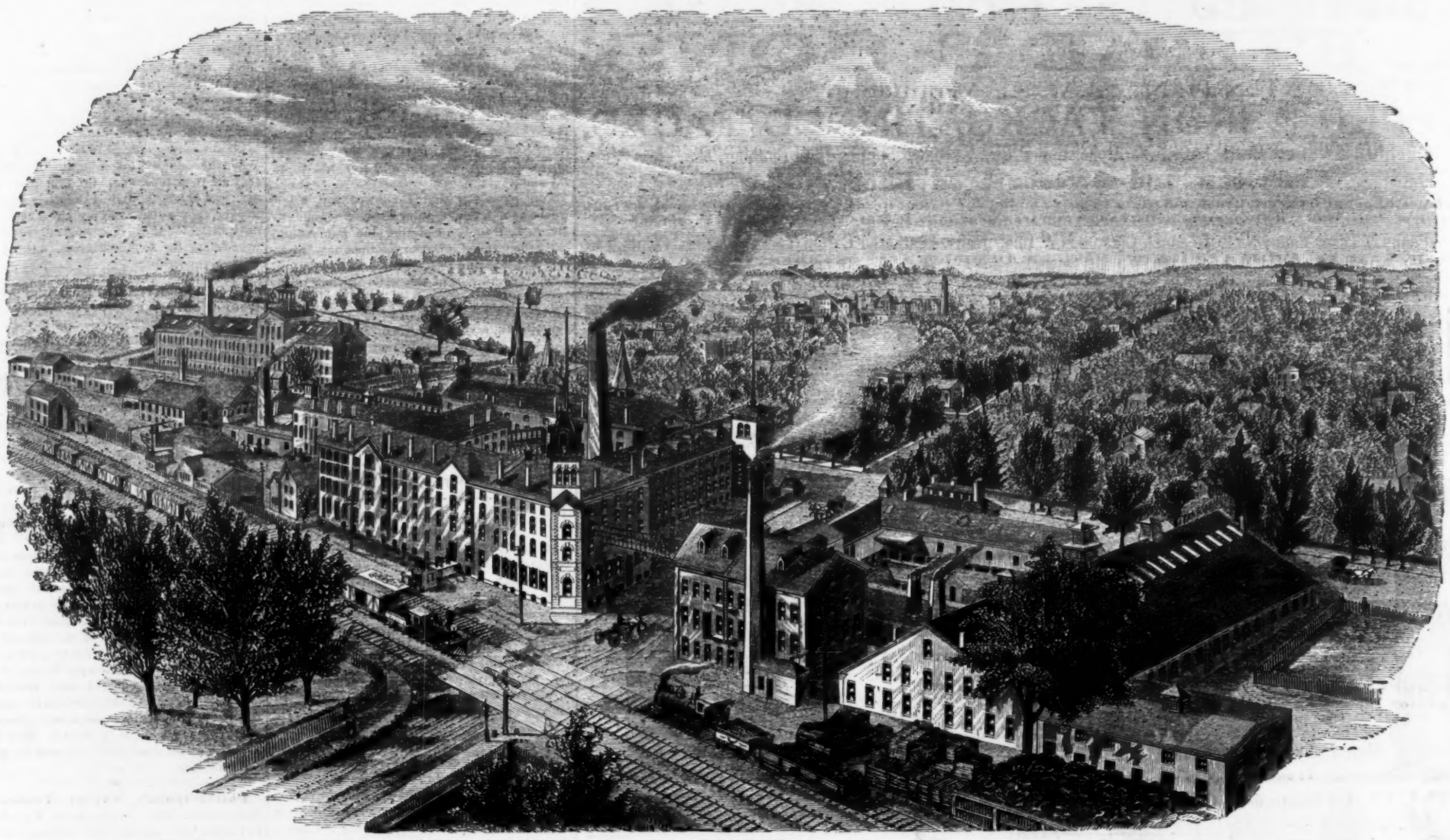

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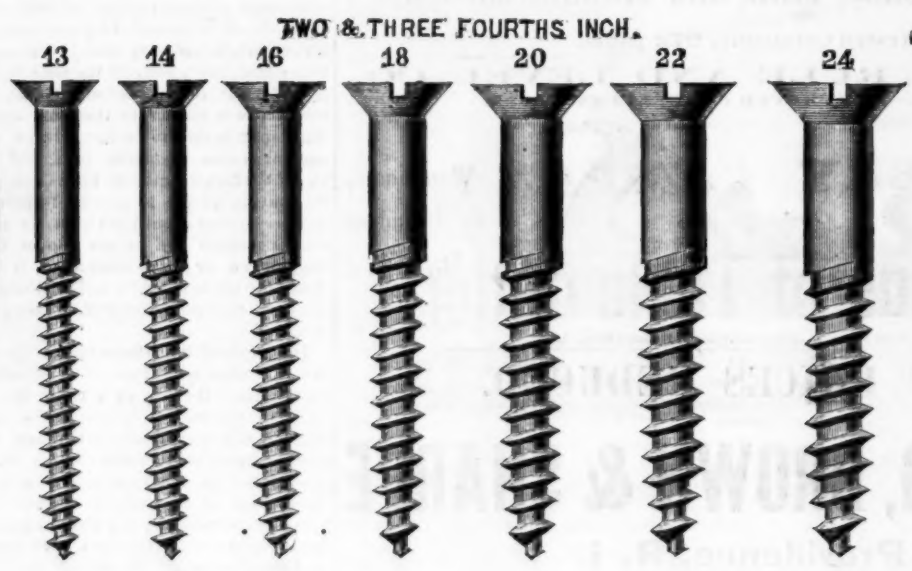
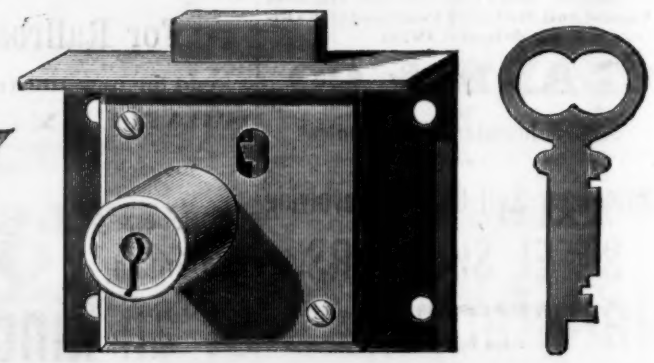
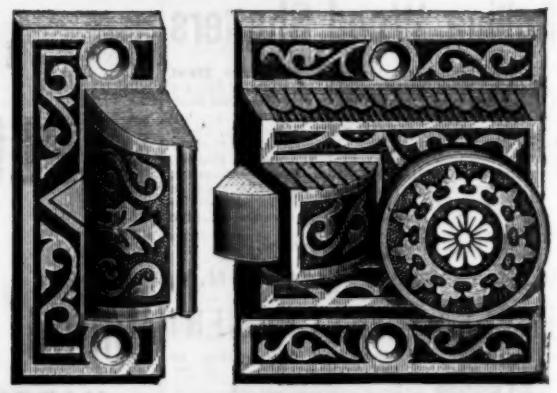
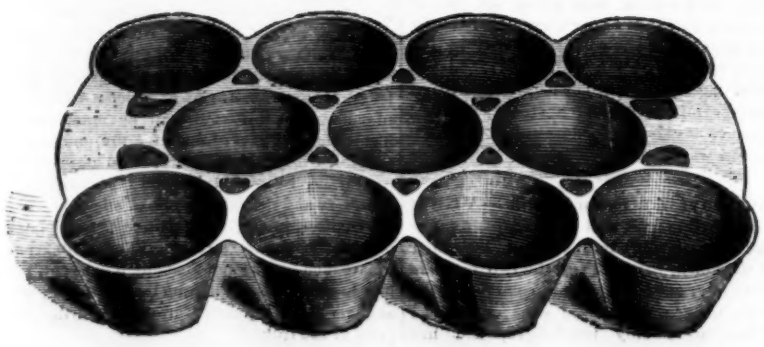
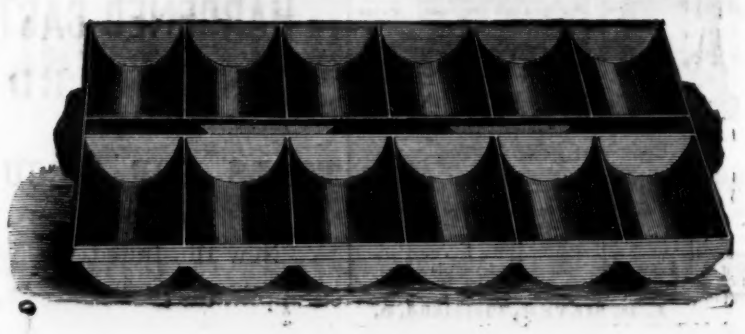
NEW BRITAIN, CONNECTICUT, U. S. A.











Promoting Foreign Trade.

The Philadelphia *North American* of June 6th says:

An adjourned meeting of the subscribers to the organization of the Associated Industries of the United States, which association is intended for the promotion of American industry and commerce, was held at one o'clock yesterday afternoon in the rooms of the Penn Club. A large attendance greatly encouraged the promoters of the movement. H. C. Carey, the president, was in the chair, and Lorin Blodget acted as secretary. The proceedings were merely the completion of the organization. The Association of American Manufacturers of Lap-Welded Tubes was elected an associate organization. It was reported that eighty signatures of leading business men and manufacturing firms of this city had been appended to the roll of membership. The next business was the election of an Executive Committee of thirty. It was composed as follows: Bloomfield H. Moore, paper; Thomas Potter, oil cloths; George Burnham, locomotives; P. C. Garrett, woolen and cotton goods; Wm. Adamson, glue, &c.; James Dobson, carpets; Joseph Lea, prints; Hamilton Disston, saws, tools, &c.; Charles H. Cramp, shipbuilding; Charles H. Spencer, worsteds; Wm. W. Frazier, Jr., sugar; A. H. Jones, chemicals; Wm. P. Clyde, shipping; John H. Zeigler, boots and shoes; Thomas M. Richards, of the Reading Railroad Company, coal; Wm. A. Drown, silks; J. B. Mitchell, books; Charles Roberts, glass; James Moore, machinery; Clayton French, paints and colors; W. C. Allison, railroad machinery; Wm. L. Elkins, oils; James S. Whitney, car wheels; Mr. Arnold, gas fixtures. On motion of Mr. Baird the committee was authorized to add to their number. It is the intention to take immediate steps to develop foreign trade in American manufactures. The meeting adjourned to meet at the call of the Chair. Hon. Morton McMichael and General Robert Patterson are the vice presidents, Lorin Blodget the secretary, and Martin Barker the treasurer of the Association.

Plate Glass Manufacture in Pennsylvania.—The Philadelphia *Ledger* of the 6th inst. says: Yesterday a conference was held at the St. Cloud Hotel between Messrs. Gobert and Brashear, plate glass manufacturers of Belgium, and Messrs. Wm. Dorris, David Blair, Samuel T. Brown, H. G. Fisher, Samuel E. Henry, C. C. North, J. S. Africa, and Alexander Port, a committee of citizens of Huntingdon, Penn., relative to the establishment of plate glass manufacture at Huntingdon. The negotiations between the parties are about concluded. The citizens have already subscribed stock to the amount of $100,000, and Messrs. Gobert and Brashear are to bring from Belgium skilled workmen and machinery for the manufacture of plate glass of the finest quality and largest sizes. The sand in the vicinity of Huntingdon is now used at the flint glass works of Pittsburgh and the Ohio River, and was pronounced by the Belgian experts as entirely suitable for the finest plate glass. Coal, lime and fire clay also abound in the immediate neighborhood. The tariff on plate glass is now fifty cents per square foot for plain, and sixty cents per square foot for silvered plates, and both the American and Belgian projectors of the new enterprise believe that they can successfully compete with the best European factories.

The express companies have created a new department devoted to "special traffic," designed to compete with the Post Office Department. They claim that in carrying merchandise in the mails the government infringed on their prerogatives. If there is any profit in the low rates they want to get it, and have determined to give the matter a trial. On and after June 1 they will carry packages not exceeding four pounds in weight at one cent an ounce, the minimum charge being ten cents. They claim as a greater inducement for the public to patronize them, greater security from their giving receipts for every package. If the express companies make this succeed, perhaps the railway companies may find it worth while to consider whether they cannot do the expressing business themselves and save the profits which now go to these middlemen. We have not heard of any express company going into the hands of a receiver.

Mr. William Baker, of Sheffield, England, has invented a process of eliminating phosphorus from molten cast iron, which consists in the employment of chlorine, which by being injected into or by being brought into contact with the molten cast iron, effects the separation in part or practically entirely of the phosphorus from the impure cast iron. In carrying out this invention he injects or passes into or brings into contact with the fluid molten cast iron chlorine in a gaseous form, and he prefers to submit the molten cast iron to the action of chlorine before it has been subjected to the action of air, as, for example, in the Bessemer process or in the ordinary puddling process, or to other decarburizing processes. Although he has mentioned the employment of chlorine gas, chlorine in conjunction with other gases may be employed, but he prefers to employ chlorine.

At the Kew Observatory, in England, some 3000 thermometers are tested and verified every year. The process consists simply in passing the instruments through a vessel of hot water, so constructed as to maintain a fixed temperature during the testing. Forty thermometers are placed in a frame and moved through the water, the temperature recorded by each one being noted as it comes before a slit in the side of the water vessel directly in front of the observer. A set of 40 can be read in about four minutes.

CLARK BROTHERS & CO.,

SOLE MANUFACTURERS OF

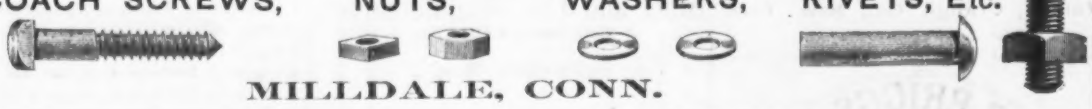
Clark's Patent Concave Carriage Bolt.

Best Bolt manufactured for all kinds of Agricultural Machinery. Will not split the wood, and cannot turn in its place.

ALSO MANUFACTURERS OF

TIRE, PLOW, MACHINE BOLTS,

COACH SCREWS, NUTS, WASHERS, RIVETS, Etc.



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EAGLE BOLT WORKS.

(ESTABLISHED 1845.)

The Original and Only Establishment Manufacturing the

Genuine Coleman Eagle Bolt.

Made of Best Quality

SQUARE NORWAY IRON.

WELSH & LEA,

Successors to M. J. COLEMAN.

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C. R. MOON & CO.,

Dealers of

WROUGHT IRON HARDWARE SPECIALTIES FOR WAGONS,

And all kinds of CARRIAGE AND WAGON MALLEABLES.

Also Manufacturers of

MOON'S IMPROVED NECK YOKE.

The Best and Cheapest in the market. Send for Catalogue. Correspondence solicited.

C. R. MOON & CO., 103 Scranton Ave. CLEVELAND, OHIO.

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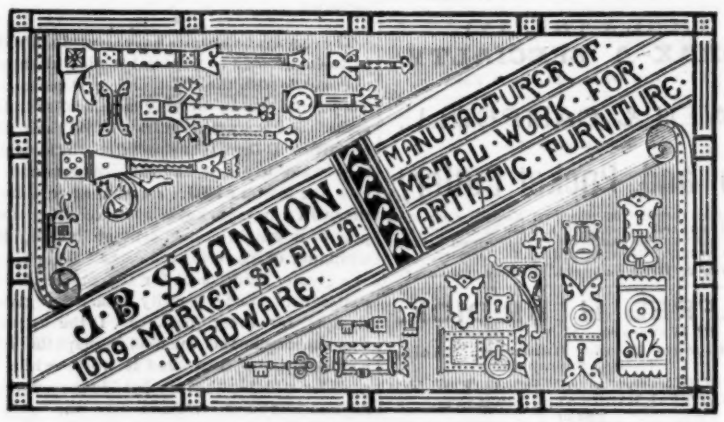
Successor to W. C. BARKER & CO.,

Iron, Steel, Nails,

HEAVY HARDWARE, WAGON AND CARRIAGE MATERIAL, DRILLS, ANVILS, BELLOWS, VISES, CHAINS, &c.

CHICAGO, ILLS.



■ Showing the Location of J. B. SHANNON'S Exhibit in Permanent Exhibition, Centennial Grounds.

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FINE GRAY IRON CASTINGS a specialty.

Unsurpassed Facilities for Light Machine Work. Japanning and Tinning done to order.

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Manufacturers of

Carriage & Wagon AXLES,

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ESTABLISHED 1839.

A Superior Quality of

SCREW BOLTS,

Lag Screws, Tap Bolts. Set Screws, Bolt Ends, Turn Buckles, &c. Manufactured by

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IRON GIMLET-POINTED WOOD SCREWS.

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MURPHY'S FINE STEEL GOODS.

Corkscrews, Rubber Knives, Floor Oil Cloth Knives, Shoe Knives, Boston Oyster Knives, Mackerel Knives, Pruning Knives, Race Knives, Cigar Makers' Knives, Paper Hangers' Knives, Dowell Trimmers, Mitering Tools, Wood Turners', Parting & Sizing Tools, Engravers' Tools, Burnishers, Cutting Nippers, Pruning Shears, Sardine Shears, Pinking Irons, Cheese Tryers, Butter Tryers, Button Hole Cutters.

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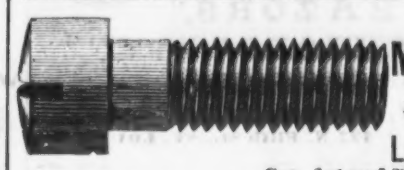

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One-sixteenth to five-eighths diameter. Heads and points to sample.

IRON, STEEL and BRASS.

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Buy Goods of the

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Send for Prices and Sample Lot. CLEVELAND, OHIO.

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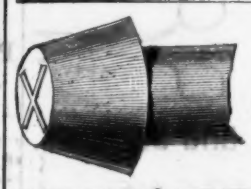
FOR SPRING TRADE.

All dealers in **SPRINGS AND AXLES** will find it to their interest to send to us for Price List and Discounts. **WOOD, SMITH & CO., Fort Plain, N. Y.**



WM. GILMOR, of WM.

MANUFACTURER OF

Boiler Rivets, Bolts, Railroad and Boat Spikes, &c.

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PATENT DOUBLE ACTING SPRING BUTTS.

Patented April 18, 1876.

Send for price list and circulars.

FOR SWINGING DOORS BOTH WAYS.

These Butts are the first ever constructed with two leaves only, and with flanges attached thereto for fastening to the door and casing, thus rendering them much more substantial and easy to put on, as the screws are all driven from the outside. By means of the flanges the door is hung firmly to the casing, instead of to a strip *as is the case with all other double acting Butts*, and the screws do not become loose, as the strain on them is much less. On the back of the Butt is a powerful volute spring, and draws in *direct line* with the center of the door, thus holding the door firmly in position, and *obviating all sag*. Our price list is from 25 to 40 per cent. lower than others. Manufactured by

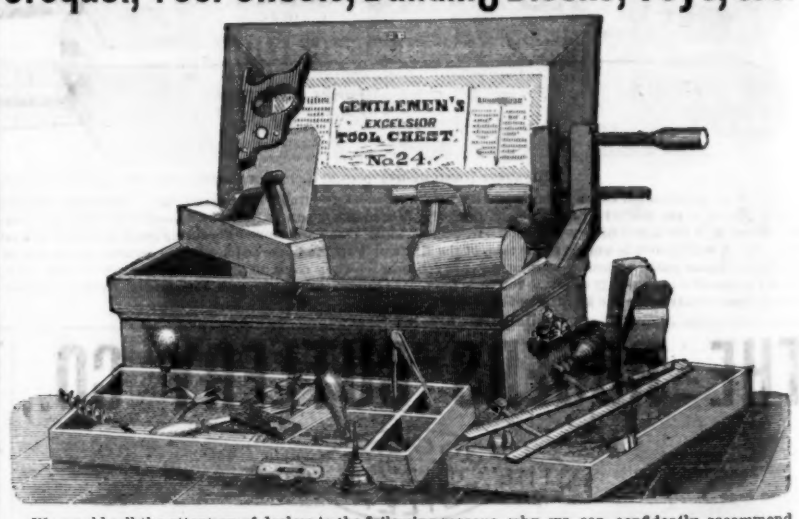
THE SABIN MFG. CO., Montpelier, Vt.

R. BLISS MFG. CO.,

Pawtucket, R. I.,

MANUFACTURERS OF

Croquet, Tool Chests, Building Blocks, Toys, &c.



We would call the attention of dealers to the following reasons why we can confidently recommend our chests as **SUPERIOR** to any yet offered to the trade:

FIRST.—They are not filled with a lot of worthless Tools, such as the cheap Hoop Iron Planes and Cast Iron Chisels commonly used, but all our Plane Irons, Chisels, Knives, Awls, &c., are warranted all steel. SECOND.—Our Boys' and Youths' Chests are not the cheap nailed Boxes commonly used for this purpose, but are made from fine Brown Ash, with Locked Corners, trimmed with Black Walnut Mountings, oiled and varnished.

The Youths' Chests are all furnished with check straps and lifting handles. Our Gent's Chests are made from the finest selections of hard wood, with patent dovetailed joints, fancy paneled covers, oiled and varnished, and are fitted with Lock and Key and Bronze Lifting Handles.

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Manufacture the Largest Variety of Forged Carriage Irons of Best Material and Workmanship.

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FORGED SET SCREWS AND TAP BOLTS.
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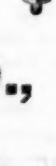

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Sole Manufacturers of an
ALL STEEL FLANGE ROLLER BUSHING,
for all kinds of Tackle Blocks. Twice as strong as the Brass.

Blocks with these bushings will be furnished at no extra cost over those with brass bushings.

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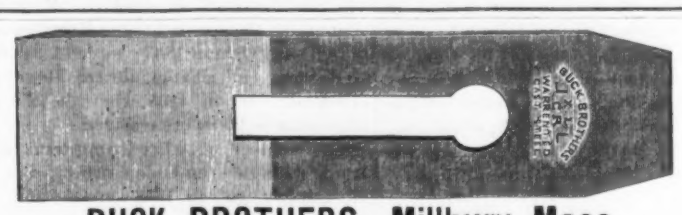
☞ Illustrated Catalogue for fall of 1876 now ready to mail free to the trade.



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The most complete assortment in the U. S. of **Shank, Socket Firmer, and Socket Framing Chisels,**

PLANE IRONS.

Gouges of all lengths, and circles beveled inside or outside. Nail Sets, Scratch and Belt Awls, Chisel Handles of all kinds. Orders filled promptly; generally same day as received.

The only **GENUINE D. R. BARTON** Tools
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Double Burner Fairy Queen.

Patented January 2, 1877.

SAFE, ECONOMICAL, DURABLE, ORNAMENTAL.

This Stove embraces in its design and construction all the required elements that ingenuity and experience could suggest to make it the most desirable and the leader of Kerosene Stoves. The reservoir or oil tank is made of heavy flint glass, protected by an ornamental black walnut top and bottom. Upon the top rests the water tank, which, when filled, covers the ratchets and surrounds the wick tubes. The water accomplishes two important objects: It destroys the disagreeable odor when burning kerosene oil, and gives additional safety to the oil tank. Send for descriptive circular.

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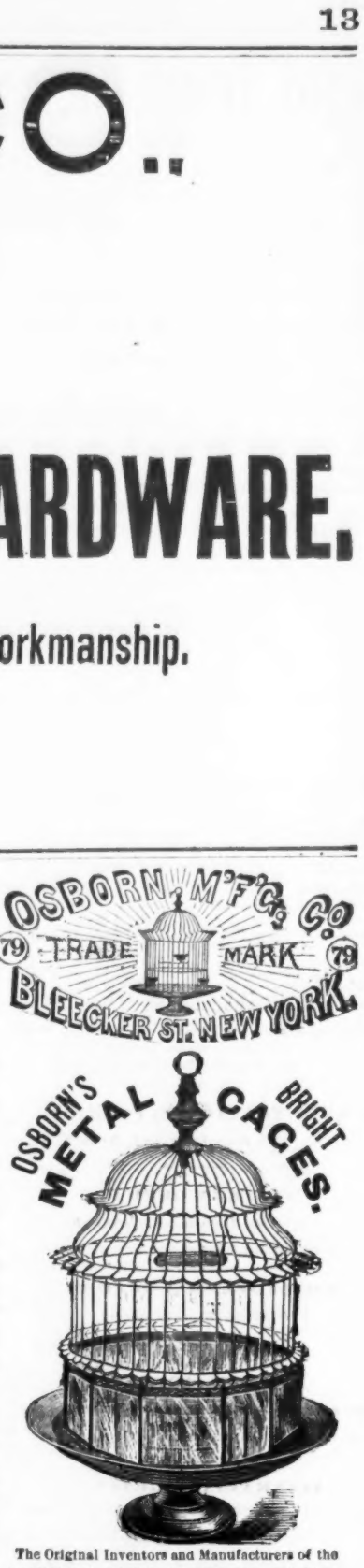
MANUFACTURERS, 242 Pearl Street, N. Y.



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Japanned and two kinds of Brass. With or without solder.
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New York, Thursday, June 14, 1877.

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The publishers of *The Ironmonger*, 44a Cannon Street, London, England, will receive orders for subscriptions and advertisements on our regular terms.

AUSTRALIAN AGENCY.

The American Hardware Company are our agents for Australia. They will exhibit files of *The Iron Age* in the American Building of the International Exhibition, at Sidney, N. S. W., where subscriptions will be received. After the close of the Exhibition, the files may be examined at, and orders for subscription directed to, their office in Melbourne. Sample copies will be mailed by them, free of charge, to any firm engaged in the trades we represent in Australia, Tasmania and New Zealand.

City subscribers will confer a favor upon the Publisher by reporting at this office any delinquency on the part of carriers in delivering *The Iron Age*; also, the loss of any papers for which the carriers are responsible. Our carriers are instructed to deliver papers only to persons authorized to receive them, and not to throw them in hall ways or upon stairs; and it is our desire and intention to enforce this rule in every instance.

CONTENTS.

First Page.—The "Haskins" Vertical Steam Engine. Prevention of Explosions in Coal Mines. Deep Mining Shafts in Europe. Heat.

Third Page.—Work by Contract. A Curious Clock.

Fifth Page.—The American Oil Feeder. American vs. Clyde Shipbuilding. Stove Founding at Sing Sing Prison.

Seventh Page.—Submarine Telegraph Apparatus. Railroad Engineering in Russia. American Locomotives in England. Transparency of Metals.

Ninth Page.—Prof. Akerman and the Henderson Process. Ferro-Chromium Steel. Five Days in a French Mine. The Pennsylvania Railroad Wages Reduction. Philadelphia's Export Trade. Strength of Iron Plates.

Eleventh Page.—Promoting Foreign Trade. Plate Glass Manufacture in Pennsylvania.

Fourteenth Page.—The Cost of Wars. The World's Telegraphic System. The Decline in Copper. The Price of Boiling at Pittsburgh.

Fifteenth Page.—Statistics of the American Iron Trade in 1876.

Sixteenth Page.—Statistics of the American Iron Trade in 1876.—(Concluded).

Eighteenth Page.—Industrial Items. The Ore Trade on the Western Lakes.

Twentieth Page.—New Publications. A Menace of Trouble for Our Ironmasters. Copper Facing Rolls for Calico Printing. Utilizing the Minerals of India.

Twenty-first Page.—Trade Report. General Hardware. British Iron Market. Iron. Metals. Exports. Imports. Coal.

Twenty-second Page.—Old Metals, Paper Stock, &c. Philadelphia. Pittsburgh. Cleveland. Boston. Chattanooga. Cincinnati. Louisville. St. Louis. Baltimore. Foreign.

Twenty-Third Page.—Foreign.—(Concluded). Our English Letter. Breaking Strain of Wire Rope.

Twenty-fourth Page.—The National Association of Stove Manufacturers.

Thirtieth Page.—New York Wholesale Prices of Hardware and Metals.

Thirty-first Page.—New York Wholesale Prices—Concluded).

Thirty-seventh Page.—Philadelphia, Buffalo, Chicago and Pittsburgh Hardware and Metal Prices.

Thirty-ninth Page.—Boston and St. Louis Hardware and Metal Prices.

The Cost of Wars.

As nations become civilized the cost of fighting seems to increase in geometric ratio, and we find that the evil results which follow a war are aggravated in a like degree. A semi-barbarous race may waste in war half its accumulated wealth and sacrifice 10 per cent. of its fighting population, and not seem much the worse a year or two after it is over. The reason for this seems to be that its wealth is not productive; it is simply money hidden, invested in jewels, or given to personal luxury. In the case of a civilized nation, the money wasted in carrying on war is withdrawn from productive industries. Capital is taken from a position in which it is earning and utterly destroyed, consequently the effects are far more lasting than in the case of a barbarous people. When we add to this the enormous cost of the material used, which is becoming greater each year, it is evident that the time is approaching when nations, willing or unwilling, cannot indulge in warfare. Could the business community once fully understand the actual loss entailed by war, we think the idea of fighting "to protect "interests" would be very suddenly abandoned. For example, England went into the Crimean war to protect her business interests. That war cost $1,700,000,000. Very few people can be made to believe that any business interests of any nation which took part in the struggle were involved to anything like the extent of seventeen hundred million dollars.

"In time of peace, prepare for war," so runs the ancient platitude, and from a little tract by the London Peace Society we take the following table, illustrating the preparations made this year for war by some of the principal nations of Europe:

	Army, Peace Footing.	Army, War Footing.	Navy. Tons.
Russia (European)	800,000	1,600,000	80,000
Germany	800,000	1,400,000	85,000
France	750,000	1,300,000	100,000
Austria	400,000	800,000	15,000
Italy	200,000	450,000	100,000
Great Britain	150,000	400,000	200,000

In other words, these six nations keep more than three million men for the sole purpose of having them ready for war. In time of peace they are idle, almost literally eating their heads off, the business of drill and the routine work of garrison or barracks serving to keep them physically in condition. We quote the following comments upon the preceding figures:

It will be seen that the total strength of the regularly trained soldiers of Europe amounts to nearly 6,000,000; or, having regard to the fact that the whole adult population of the nations of Europe, except Great Britain, is liable to be called to take arms, the total military force may be estimated at from 6,000,000 to 10,000,000. The lesser number equals the whole of the adult and efficient populations of the British Islands. It has been pointed out that if only one-half of the present excessive armies of Europe were disbanded at least 3,000,000 men of from 20 to 35 years of age would be restored to productive labor, and $500,000,000 of money saved from oppressive taxation.

Here are some figures which illustrate the loss of life entailed by a war:

War.	Loss of Life.
Crimean	750,000
Italian, 1859	45,000
Schleswig-Holstein	3,000
American civil war	800,009
Prussian, 1866	45,000
Franco-German war of 1870-1. French.	155,000
Franco-German war of 1870-1. German.	60,000

Here we have the mortality of the wars of twenty-five years, amounting to almost 2,000,000 able bodied men. This is a bad showing, but we may congratulate ourselves that wars of the present day are not as deadly as in former times. Arms of precision separate armies by greater distances and diminish the numbers of the killed. Probably in the future naval engagements will show heavy losses of life as compared with those upon land.

If in war the loss of life is heavy, the loss of wealth is no less so, as is shown in the following table:

	Cost.
Crimean war	$1,700,000,000
Italian war of 1859	300,000,000
American civil war, the North	4,700,000,000
American civil war, the South	2,300,000,000
Schleswig-Holstein war	35,000,000
Austrian and Prussian war in 1866	330,000,000
Franco-Prussian war	2,500,000,000
Other wars, expeditions, &c.	200,000,000
Total	$12,065,000,000

In this list of wars, expeditions, etc., the allied expedition against China, the Indian mutiny, Abyssinian, and Ashantee campaigns are all excluded. It is said that the general expenditure of Great Britain upon war debt and warlike preparations since 1851 amounts to the large sum of $6,528,163,995. This sum would build more than 26,000 miles of railway at the rate of $250,000 per mile, and leave about half a million dollars for a margin. Figures so enormous leave the human imagination helpless, but we gain some idea of what the tax upon the race is, when we say that it has been calculated to be equal to ten dollars per head for the whole population of the globe, men, women and children. This sum has been taken from the productive capital of the civilized world and utterly wasted within the last twenty-seven years. What wonder, therefore, that business is at a stand and the world's work undone? One conclusion only seems possible: war must stop, if for business and commercial reasons only. We imagine that it will take but few generations longer to convince the peoples of the world that they cannot afford the luxury of fighting.

The World's Telegraphic System.

There is no modern invention that we are aware of which, during the past ten or twelve years, has developed so rapidly as the world's telegraphic system, especially on the continent of Europe. But from the moment that war and insurrection break out, the as yet unprotected nature of the wires on land lines exposes them to immediate destruction, a gap severs both internal and international communication, and the transit of messages, as for instance through part of the Turkish dominions to India, is stopped.

In the event of a general war, which is not now probable, the entire overland system of Europe and Asia would be upset for an indefinite time. It will therefore prove of interest to examine, by the light of recent statistics, what has been accomplished in the way of land telegraphs by the leading commercial nations of Europe, as well as by our own country.

Russia, to begin with, has made remarkable progress. The length of the Russian lines, which was about 22,000 miles in 1865, had reached 51,000 in 1874. In 1865 the number of messages transmitted did not exceed 860,000, while in 1874 upward of 3,000,000 were dispatched. Messages sent across the frontier from Russia numbered but 92,000 in 1865; in 1874 312,000 were thus sent. From abroad there arrived but 7000 in 1865, whereas in 1874 more than 58,000 were received.

The number of offices, apparatus and operators in the remaining principal commercial countries in 1875 were the following:

	Offices.	Apparatus.	Operators.
United States	7,072	10,184	12,000
Great Britain, home	5,607	16,038	11,605
" " India	925	1,020	2,929
Germany	4,335	4,477	4,610
France	4,266	5,069	5,410
Austria	2,212	1,653	3,354
Italy	1,726	1,913	4,302
Switzerland	1,002	1,351	1,577
Hungary	887	1,303	1,335
Belgium	586	1,068	1,756
Sweden	521	975	714
Netherlands	330	379	1,082
Norway	172	297	637
Roumania	165	182	1,108
Greece	63	120	341
Persia	46	67	385
Total	29,914	46,116	53,025

Telegraphic Area in Square Miles and Extent of Lines.

	Area, miles.	Lines, miles.	Wires, miles.
United States	4,702,980	89,032	147,581
Great Britain, India	2,474,573	16,648	35,047
" " home	188,981	23,339	105,910
Persia	990,000	2,095	4,303
France	317,416	30,968	81,566
Germany	267,157	21,425	79,386
Sweden	264,972	4,533	15,310
Hungary	193,410	8,602	23,902
Austria	180,115	19,700	50,900
Norway	188,918	4,308	7,443
Italy	177,784	12,976	45,308
Roumania	72,584	2,292	4,105
Greece	30,127	1,539	1,893
Switzerland	24,851	3,977	10,693
Holland	19,725	2,064	7,399
Belgium	17,674	2,975	12,656
Total	10,111,267	246,470	638,222

Population and Number of Messages Forwarded in 1875.

	Population.	Messages in thousands.	Messages per 1000 inhabt's.
Great Britain	31,621,338	21,063	666
British India	240,597,443	915	4
United States	38,855,137	18,529	477
France	36,5 0,000	10,482	287
Germany	35,851,474	11,292	314
Italy	26,801,154	5,209	191
Austria	20,394,980	4,116	208
Hungary	15,417,327	2,033	135
Persia	6,500,000	617	95
Belgium	5,336,634	2,871	543
Roumania	5,000,000	966	193
Sweden	4 583,291	1,147	286
Netherlands	3,809,804	2,198	578
Switzerland	2,669,147	2,926	1,084
Greece	1,457,894	244	174
Total	475,302,623	84,658	5,234

The following table shows the number of letters forwarded as compared with the number of messages in Europe only:

	Per 1000 inhabitants. Letters.	Telegrams.	Number of letters to every telegram.
United Kingdom	34,500	666	52
Switzerland	27,300	1,084	25
Germany	15,300	314	49
Netherlands	14,000	578	25
Belgium	13,000	542	24
Austria	10,600	208	51
France	10,200	287	36
Norway	5,600	408	14
Sweden	5,500	286	19
Italy	4,500	191	24
Hungary	4,400	135	33
Greece	2,100	174	12

These figures are of much interest, and show how extensive and important a means of inter-communication the telegraph has become. The surprising progress of modern civilization is best shown by the fact that the idea of practical telegraphy was conceived during the memory of the present generation, and that of those who participated in the building of the first experimental line some are still living and actively engaged in the duties of life.

We print in other columns of this issue copious extracts from the introductory pages of Mr. James M. Swank's "Annual "Statistical Report for the year ended De- "cember 31st, 1876," just presented to the members of the Iron and Steel Association and the public. We think it may safely be pronounced the most valuable compilation of iron trade statistics ever made. The pages showing the development and present condition of the iron industries of other countries are especially valuable, and are a new and interesting feature of the report. Mr. Swank has brought to the work of his office peculiar qualifications, and with the valuable assistance of his associate, Mr. George H. Cope, has exactly systematized the collection and classification of the statistics of the iron trade. We tender these gentlemen our congratulations upon the increasing value and thoroughness of their work. The present volume is, in our judgment, of larger statistical value than any previous publication relating to our iron industries.

The Decline in Copper.

The course of copper prices in Europe has been so rapidly downward of late, and such low figures have been reached, especially for Chili bars, that we should have to go back as far as the Franco-German war, seven years ago, to find a parallel for such extreme depression. The average value of Chili bars last year was £77 per ton, against £82 in 1875. Since then the price has been as follows:

Jan. 1	£76	April 1	£70
Feb. 1	74	May 1	69
March 1	71	June 1	69

As low as £68 was reached when Russia declared war. To a certain extent the decline was precipitated by the apprehension that England might be involved in the war, but principally by the unpromising statistical aspect on the other side.

The average visible supply in England and France last year was 30,964 tons, against 30,777 in 1875. On the 1st of January, 1877, it stood 34,950, and on the 1st of May 37,266 tons, being 6302 tons in excess of last year's average. Of Chili bars alone, taking Liverpool, Swansea and Havre together, the stock was 24,526 tons on May 15, against 13,842 in 1876, or nearly double that of last year.

Production in Chili seems to be rapidly increasing, despite low prices. Thus, of fine copper there were shipped from Chili and Bolivia last year, 50,911 tons, against 46,587 in 1875, 48,405 in 1874, 42,309 in 1873, 46,495 in 1872, and 41,341 in 1871. Chili thus produces to its full capacity, and Europe annually receives an increased quantity from this country. It is not to be wondered at, therefore, if, in view of the disturbed condition of continental politics, merchants and manufacturers proceed with the utmost caution in their dealings in this metal. Those who during the latter part of 1876 tried to control the European markets by a vast speculation in Chili bars at London, have since discovered that in the present condition of trade in the old world gigantic metal operations, even with an easy money market, are more than precarious. Under these circumstances the legitimate trade demand for copper will either have to improve materially in Europe, or that for war purposes assume proportions beyond all present expectations, or else production on the West Coast will have to be curtailed by a fall in prices below the current rate at Valparaiso. There being little prospect of any very great increase of consumption in Europe in the present state of affairs, decreased production would seem the only remedy.

The English trade movement in copper during the first four months of the year may be shown as follows:

		1875.	1876.	1877.
Import	Tons.	29,052	24,208	29,199
		1875.	1876.	1877.
Export	Tons.	15,603	16,330	18,580

While the import has been on the increase, the export, it will be seen, has been developing in a satisfactory manner, principally due, we presume, to greater activity between England and British India since the price of silver has become steady once more.

Prices here have varied little since the beginning of the year, ranging between 19⅛ and 19¾ cents, notwithstanding the early and not unimportant purchases for Europe, and despite the limited available supply we have at the present moment.

The manufacturers of brass goods have had a fair call for their current production, while the cartridge makers have been busy all along to supply both Turkey and Russia. Consumption of the raw material is therefore all that could be wished for, and the users of it are known to carry light stocks. With money as easy as it is at present, speculation would have meddled with copper long ago, had the conditions been as favorable as during the time which preceded the panic; but no one now cares to venture a large operation in metal, and we shall have to wait for the legitimate influences to gradually raise the value of the raw material.

In view of all the circumstances attending the situation here the value of copper is very low, as is shown by the following monthly averages of quotations during the past four years:

Value of Ingot Copper at New York in Currency.

	1873.	1874.	1875.	1876.
January	35	25	23¼	23
February	34¾	25	23	22⅝
March	34	24⅝	21⅛	22⅛
April	34	25	22⅛	22⅛
May	32⅛	25	23	22
June	29⅛	24¼	23	20¼
July	28¾	24	23	20⅛
August	27	24	23⅛	19⅛
September	27	23⅛	23⅛	20⅛
October	24⅛	23⅛	23¼	21
November	24⅛	23⅛	23⅛	20¾
December	24⅛	23⅛	23⅛	20

In view of all the aspects and probabilities of the situation, the present low price of copper is well calculated to inspire confidence in the near future of the metal.

The Price of Boiling at Pittsburgh.

The time for arranging for the wages to be paid for boiling at Pittsburgh has passed without any strike or lockout based on wages, and the price for this work is probably settled for the next year, the rates being the same as for last year. The scale is in the nature of a contract between the puddlers at each mill and the mill owner, holding for one year, and only to be changed by either party giving sixty days' notice. The scale is as follows:

Card on iron	$2 5-10.	Boiling shall be	$5·00
" "	2 6-10.	" "	5·10
" "	2 7-10.	" "	5·20
" "	2 8-10.	" "	5·30
" "	2 9-10.	" "	5·40
" "	3	" "	5·50
" "	3 1-10.	" "	5·65
" "	3 2-10.	" "	5·80
" "	3 3-10.	" "	5·95
" "	3 4-10.	" "	6·10
" "	3 5-10.	" "	6·25
" "	3 6-10.	" "	6·45
" "	3 7-10.	" "	6·65

And advancing 20c. per ton with each 1-10 advance in card price of iron.

A number of the mills have already signed the contract. Others have a larger supply of muck bar on hand and will run their rolls awhile on this, but will sign the scale when they start their boiling furnaces.

The question has been asked, and it is a pertinent one, Why did the rolling mill men of Pittsburgh agree to such a scale of prices so much above what the present price of iron will justify? There are several reasons. In the first place quite a percentage of the boiling furnaces in Pittsburgh run on iron for uses other than for working into merchant bar. There are, for example, between forty and fifty boiling furnaces in the steel works making iron for conversion. A number of the iron mills are making high priced iron for specialties. For the amount of boiling these works do, and the uses to which it is put, they can afford to pay more than the mills running on merchant iron. They are also, most of them, in a condition as to orders that will not permit them to stop, and they must run at any price. If these mills run it fixes the price.

Another reason is that many mills are using considerable scrap, and the amount of puddled iron is very much reduced, and, by reflex action, the high price demanded for boiling reduces it still more. The amount of scrap being returned to the mill is quite large. The receipts of scrap iron at Pittsburgh for the first five months of the past four years has been as follows:

	1874.	1875.	1876.	1877.
January	460	2,917	2,686	2,706
February	530	1,564	2,623	3,192
March	1,720	3,393	2,425	4,295
April	1,210	4,615	3,076	5,585
May	1,340	3,568	4,674	4,781

This does not show all the scrap iron received, as but few, if any, old rails are included in the amount, nor does it include the scrap made in Pittsburgh, which is no inconsiderable amount. This makes the amount of puddling done very much less, and makes it possible to pay a higher price for what is done.

Another reason why the Pittsburgh mills concluded to sign the contracts is that they have found it does not pay to fight the battles of the whole West and be idle for months when the mills West are running and taking their trade, and get any benefit that may accrue without any of the losses. It is a well known fact that a large number of the mills west of Pittsburgh have a contract with these men that, in case of labor difficulties at Pittsburgh, there shall be no strike at their mills, but the mills shall run, and whatever is settled upon at Pittsburgh shall govern.

The threatened strike of the engineers on the Pennsylvania Road has been averted, the engineers having shown rare good wisdom in accepting the reduction asked, they being all the more ready to do so as it applied to all grades of salaried labor as well as other. There is no question that the Brotherhood of Locomotive Engineers is the most intelligent of all the labor unions in the country. They have shown this by persistently refusing to encourage or to authorize strikes, and their chief officers have retained their positions and influence, not by leading their organization into strikes, but by their ability in keeping out of them, in this showing a marked difference from other unions. For this reason their course in the last few months has been a mystery to those acquainted with their past history, and we can only hope that they will not again be led into the position they found themselves in their contest with the New Jersey Central and B. and M. Railroad. They have lost prestige and sympathy by these contests.

We print upon another page a full telegraphic report of the opening of the National Stove Founders' Association, now in session at Detroit, Mich., with President Jewett's address in full. Next week we shall present to our readers a complete report of all the sessions.

In a recent article on cotton ties we advanced the opinion that the placing—by the American Cotton Tie Company—of the much talked of order for cotton ties in England would have the effect of bringing out new ties in competition with those of this company. As we mentioned at the time, a company had been formed in Youngstown, O., to manufacture ties, and now it is stated that Jas. Bown & Son, of Pittsburgh, are filling an order for 200 tons of a new patent tie for Totten & Saulpaw, of Nashville. The entire tie is made at Bown & Sons, except the strip, which is made by Lindsay & McCutchen. The patentees expect to sell 1000 tons this year. The tie has the name "Boss Cotton Tie."

The Chicago, Burlington and Quincy Railroad Company require all material, of whatever kind, to stand a thorough practical and scientific test before being delivered to the locomotive, car or track depots. All boiler material is tested by bending while cold, which it must do without showing a flaw, and by getting the tensile strength of every sheet. Every sheet of iron for fire box use must stand a tensile strain of 60,000 pounds per square inch. Every sheet of boiler material not for fire box use must stand a strain of 55,000 pounds per square inch. Every sheet of steel for fire box use must stand a tensile strain of 70,000 pounds per square inch, and no sheets of iron can be issued from the store without being marked "Tested, O. K." All stay bolt iron must stand 60,000 pounds per square inch, and bend double cold without showing any flaw, and a bolt ¾ inch in diameter must bend double cold, with a thread cut on it, without showing cracks more than ⅛ of an inch in depth. All common bar iron, whether round or flat, must bend double cold without showing a flaw deeper than ⅛ inch, and bend double red-hot without showing any tendency to "red-shortness." All flues or boiler tubes must be of maker's weight, not less than No. 13 (wire gauge) in thickness, nor greater than No. 11; must calk into a flue sheet without cracking or showing any seams in iron; must flat down and bend double cold without showing any flaw or crack either across or lengthwise of flue, and must show a homogeneous material when subjected to an acid bath.

The Eastern Railroad Association have been making some experiments which forbode more disasters after the Ashtabula pattern. They are stated to indicate that much of the iron now in use will stand only about two-thirds of the strain which it is guaranteed to resist. For instance, some iron being put into a new bridge at the East, which is supposed to stand a pressure of 60,000 pounds to the square inch, breaks readily at 40,000 pounds, and a car axle, supposed to be equal to 110,000 pounds, snapped at 70,000. The moral responsibility for a railroad massacre, under such conditions, would reach back to the makers of the faulty metal.

Statistics of the American Iron Trade in 1876.

We have received from Mr. James M. Swank, Secretary of the American Iron and Steel Association, a copy of his annual statistical report presented to the members on the 15th ult. From the introductory pages we make the following extracts, which summarize the showing of the large tables, for which we cannot make space this week:

GENERAL ANALYSIS, IN NET TONS OF 2000 POUNDS.

We give in the following table an analysis of the total iron and steel production of the United States during the past five years:

PRODUCTS.	1872.	1873.	1874.	1875.	1876.
Pig iron.....All rolled iron, including nails and rails...	2,854,558	2,868,278	2,689,413	2,266,581	2,093,236
All rolled iron, including nails and exclusive of rails.....	1,911,998	1,966,445	1,839,100	1,500,579	1,921,790
Bessemer steel rails.....	941,992	1,076,368	1,110,147	1,097,867	1,042,101
Bessemer steel ingots.....	94,070	129,015	144,944	330,863	412,461
Iron and all other rails.....	965,980	761,063	584,469	501,649	467,168
Street rails, included in iron rails.....	15,000	9,430	6,739	16,810	18,096
Rails of all kinds.....	1,000,000	890,077	729,413	792,512	879,629
Kegs of cut nails and spikes, included in all rolled iron.....	4,063,332	4,044,704	4,912,180	4,726,881	4,157,814
Crucible cast steel.....	29,200	34,786	26,328	39,382	39,382
Open-hearth steel.....	3,000	3,500	7,000	9,050	21,490
All other steel, except Bessemer.....	7,700	18,714	6,353	13,077	10,306
Bessemer steel ingots..	180,108	170,652	191,503	375,517	525,906
Blooms from ore and pig iron.....	58,000	63,564	61,670	40,249	44,628

PRODUCTION OF PIG IRON IN 1876.

The production of pig iron in the United States in 1876 was 2,093,236 net tons, against 2,266,581 tons in 1875, 2,689,413 tons in 1874, 2,868,278 tons in 1873, and 2,854,558 tons in 1872. The decrease in 1876, as compared with 1875, was 173,345 tons, or about 8 per cent. Since 1873, the year of greatest production, each year has shown a decrease as compared with the preceding year, the percentage of decrease being as follows: 1874, 6 per cent.; 1875, 15 per cent.; 1876, 8 per cent. From 1873 to 1876 the decrease has been 775,042 tons, or 27 per cent. This is a very great shrinkage, and indicates, with concurrent low prices, a very great depression in the pig iron industry of the country. If the rate of decrease which marked the period from 1873 to 1876 were to be continued, the production of pig iron in the United States would entirely cease in 1884, less than eight years from the present time, and our furnace stacks would only be useful as observatories for the study of astronomy. But our pig iron industry is not destined to come to such an untimely end, for we see that the heavy percentage of decrease which had characterized the year 1875 was not continued in 1876—the decrease in the former year being 15 per cent., and in the latter year only 8 per cent. It seems plain, from a consideration of the relative decrease in these two years, that the mere production of pig iron commenced last year to rally from the effects of the panic of 1873, and this view is strengthened by reference to the statistics of the stocks of pig iron on hand and unsold at the close of the last three years, which will be found elsewhere in this report. At the close of 1874 these stocks amounted to 795,784 net tons; at the close of 1875 to 760,908 tons; and at the close of 1876 to 674,798 tons. A decrease in stocks at the close of last year, and the arrest in 1876 of the headlong decline in production which characterized 1875, are certainly strong symptoms of an early increase in the manufacture of American pig iron. We believe that we stand even now within the shadow of this increase. From information in our possession, and from a careful survey of the whole field embraced by the iron and allied industries of the country, we feel entirely safe in predicting that the production of pig iron in 1877 will be at least as great as it was in 1876. It is for the producers to decide whether it is wise to increase production at present prices.

Twenty-three states and the Territory of Utah made pig iron in 1876. Pennsylvania made almost one half of the total product, namely, 1,009,613 net tons, or 48·2 per cent., slightly increasing its production over that of 1875, and largely increasing its percentage, which was 42·4 in that year. Ohio came next to Pennsylvania in 1876, making 403,277 tons, or 19·2 per cent., showing a slight decrease upon its production in 1875, but also a slight increase in its percentage, which was 18·3 in 1875. New York decreased its production from 266,431 tons in 1875 to 181,620 tons in 1876; New Jersey from 64,069 tons in 1875 to 25,349 tons in 1876; Massachusetts from 21,255 tons in 1875 to 5040 tons in 1876; Maryland from 38,741 tons in 1875 to 19,876 tons in 1876; Virginia from 29,985 tons in 1875 to 13,046 tons in 1876; Kentucky from 48,339 tons in 1875 to 34,686 tons in 1876; Indiana from 22,081 tons in 1875 to 14,547 tons in 1876. A few other states show a slight decrease in 1876 upon their production in 1875. Of the states which followed the example of Pennsylvania by increasing their production, West Virginia increased from 25,277 tons in 1875 to 41,165 tons in 1876; Illinois from 49,762 tons in 1875 to 54,168 tons in 1876; and Missouri from 59,717 tons in 1875 to 68,223 tons in 1876.

The table which shows the production of pig iron in late years in leading districts, will be found to possess some interesting features. The production of the Lehigh Valley has declined from 449,663 net tons in 1872 to 261,274 tons in 1876; that of the Schuylkill Valley from 232,225 tons in 1872 to 144,969 tons in 1876; that of the two Susquehanna valleys from 286,565 tons in 1872 to 182,586 tons in 1876. The Shenango and Mahoning valleys did not jointly or severally produce as much pig iron in 1876 as in 1872, but each district increased its production in 1876 over that of 1875—the Mahoning Valley in a marked degree. In the Hanging Rock district the production of coke pig iron almost doubled from 1872 to 1876, while the production of charcoal pig iron declined a little more than one-half in the same period.

Of the total production in 1876 of 2,093,236 net tons of pig iron, 990,009 tons were smelted with bituminous coal and coke; 794,578 tons with anthracite coal, and 308,649 tons with charcoal. The production of bituminous coal and coke pig iron first exceeded that of anthracite in 1875, and then by only 39,499 tons; but in 1876 anthracite fell 195,431 tons below its rival, and 113,468 tons below its own production in 1875. The production of bituminous pig iron was greater in 1876 than in 1872, and 42,464 tons greater in 1876 than in 1875. The production of charcoal pig iron has declined almost 50 per cent. from 1874 to 1876. In the latter year the production was 308,649 tons, against 576,557 tons in 1874, and 410,990 tons in 1875.

The whole number of completed furnaces in the country at the close of 1876, which were either active or capable of being transferred to the active list on short notice, was 714, against a similar total of 713 at the close of 1875. We are advised that 10 new furnaces were completed in 1876, and that 9 old furnaces were abandoned. The greatest activity in the erection of new furnaces has been shown in the Hocking Valley, in Ohio, where several bituminous furnaces have been built since the beginning of 1876, while others are now in course of erection or definitely projected. Of the furnaces which were built in 1875 and blown in 1876, we note the Centennial Furnace of the Cambria Iron Company, 75 feet high by 20 feet at the bosh.

Of 714 completed furnaces at the close of 1876, 236 were in blast and 478 were out of blast. Of 713 furnaces at the close of 1875, 293 were in blast, and 420 were out of blast. The productive capacity of the furnaces of the country is at least twice the actual yield of either of the last two years.

Below we present a table showing the growth of the various branches of the pig iron trade of the United States from 1854 to 1876, compiled from statistics procured by this Association. In this table the tons used are net tons.

Years.	Anthracite.	Charcoal.	Bituminous Coal and Coke.	Total.
1854	339,435	342,298	54,485	736,218
1855	381,866	339,922	62,390	784,178
1856	443,113	370,470	69,554	883,137
1857	390,385	330,321	77,451	798,157
1858	361,430	285,313	58,351	705,094
1859	471,545	284,041	84,841	840,627
1860	519,211	278,331	122,228	919,770
1861	409,229	195,278	127,037	731,544
1862	470,315	186,660	130,687	787,662
1863	577,638	212,005	157,961	947,604
1864	684,018	241,853	210,125	1,135,996
1865	479,558	262,312	189,682	931,582
1866	749,367	332,580	268,396	1,350,343
1867	798,638	344,341	318,647	1,461,656
1868	893,000	370,000	340,000	1,603,000
1869	971,150	392,150	553,341	1,916,641
1870	930,000	365,000	570,000	1,865,000
1871	956,608	385,000	570,000	1,911,608
1872	1,369,812	600,587	984,159	2,854,558
1873	1,312,754	577,620	977,904	2,868,278
1874	1,302,144	576,557	910,712	2,689,413
1875	908,046	410,990	947,545	2,266,581
1876	794,578	308,649	990,009	2,093,236

The following table gives the ascertained and estimated production of pig iron in the United States from 1810 to 1852, in gross tons of 2240 pounds. We preserve the gross ton in this table because the figures contained in it have now become historical.

Years.	Pig Iron.	Years.	Pig Iron.
1810	54,000	1842	215,000
1820	20,000	1846	765,000
1828	130,000	1847	800,000
1829	142,000	1848	800,000
1830	165,000	1849	650,000
1831	191,000	1850	564,755
1832	200,000	1852	500,000
1840	315,000		

PROBABLE CONSUMPTION OF PIG IRON IN LATE YEARS.

Below is a statement which approximately shows the consumption of pig iron in the United States in the last six years. In this calculation it has been assumed that the quantity of pig iron carried in stock has not greatly varied from year to year.

Commercial movement.	1871. Net tons	1872. Net tons.	1873. Net tons.
Production	1,911,608	2,854,558	2,868,278
Importation	345,535	295,967	154,708
Total supply	2,257,143	3,150,525	3,022,986
Exportation	2,330	1,477	10,103
Total consumption	2,154,813	3,149,048	3,012,883

Commercial movement.	1874. Net tons.	1875. Net tons.	1876. Net tons.
Production	2,689,413	2,266,581	2,093,236
Importation	61,165	66,457	83,072
Total supply	2,750,578	2,333,038	2,176,308
Exportation	16,039	8,738	3,805
Total consumption	2,734,539	2,324,300	2,172,503

The figures indicate that the consumption in 1876 was equal to that in 1871, the year which marked the beginning of the "iron famine." The changed condition since that year of the pig iron branch of the American iron trade is seen more in the fall in prices than in the decrease in production.

PRODUCTION OF ROLLED IRON IN 1876.

The total production of all kinds of rolled iron in the United States in 1876 was 1,921,730 net tons, against 1,890,379 tons in 1875, 1,839,560 tons in 1874, and 1,966,445 tons in 1873. As 1873 was the year of greatest production of rolled iron in this country, the steady maintenance in each of the succeeding years of a production only slightly less than the production of that year shows that our rolling mills have been more actively employed than is generally supposed. The country rolled almost as much iron in 1876 as in 1873. Even the decline in the demand for American rails has not been so marked as to justify the prognostications of evil that have been uttered on every hand—the difficulty here being that Bessemer rails have been largely substituted for iron rails, and not that rails of any kind have not been wanted. The following table will show how evenly the production of rails has continued since 1872, when the production of 1,000,000 tons was achieved under an immense pressure from railway companies; and it will show also how the production of other forms of rolled iron has steadily and with great uniformity exceeded since 1872 the production of that year.

Years.	Rails. Net tons.	Other Rolled Iron. Net tons.	Total Net Tons.
1861	335,369	536,958	872,327
1865	356,292	500,048	856,340
1866	430,778	595,311	1,026,089
1867	462,108	579,838	1,041,946
1868	506,714	598,286	1,105,000
1869	593,586	642,420	1,236,006
1870	620,000	705,000	1,325,000
1871	775,733	710,000	1,485,733
1872	1,000,000	941,992	1,941,992
1873	890,077	1,076,368	1,966,445
1874	729,413	1,110,147	1,839,560
1875	792,512	1,097,867	1,890,379
1876	879,629	1,042,101	1,921,730

In speaking of the demand for rails we do not overlook the fact, which will be referred to farther on, that the country laid down during the few years preceding the panic a large quantity of foreign rails in addition to the home supply. The point we make is that the demand for American rails and other rolled iron of American manufacture has not greatly declined since the panic.

It is again apparent that the difficulties under which the American iron trade has labored since the panic of 1873 relate more to prices than to the decrease in demand. We simply do not purchase abroad the large quantities of rails, bar iron and pig iron that we once did; but of the home supply of these products we consume nearly as much as we ever did, except of pig iron in the exceptional years of 1872 and 1873.

PRODUCTION OF RAILS IN 1876.

Passing from a general statement of the rolled iron production of the country to the particulars of that production, we find that in 1876 there were rolled 879,629 net tons of rails, an increase of 87,117 tons, or 11 per cent. upon the make of 1875, which was 792,512 tons. Of the total production in 1876 there were 412,461 tons of Bessemer steel rails and 467,168 tons of iron rails, against 290,863 tons of Bessemer steel rails and 501,649 tons of iron rails in 1875. The production of Bessemer steel rails almost overtook that of iron rails in 1876. Included in the above figures of the production of iron rails are a few tons of steel rails and steel headed rails, not Bessemer. The production of rails of this class in late years has been as follows: 1873, 26,377 net tons; 1874, 17,181 tons; 1875, 19,436 tons; 1876, 12,791 tons.

The production of street rails in late years is included in the aggregates of iron and steel rails above given. The exact figures are as follows: 1873, 9430 net tons; 1874, 6739 tons, of which 1000 tons were Bessemer steel; 1875, 16,340 tons, of which 2308 tons were Bessemer steel; 1876, 13,086 tons, of which 3563 tons were Bessemer steel.

Nineteen states and the Territory of Wyoming made rails in 1876, and the percentage of the whole product which each produced is as follows: Pennsylvania, 40·24; Illinois, 20·63; Ohio, 11·46; New York, 6·52; Maryland, 2·14; Wisconsin, 2·41; Indiana, 3·34; Massachusetts, 1·03; Missouri, 2·38; Tennessee, 2·43; California, ·98; Wyoming Territory, 1·40; Georgia, 1·02; Vermont, 1·05; Kentucky, ·17; Kansas, 1·68; Maine, ·85; New Jersey, ·03; West Virginia, ·06; Michigan, ·18.

At the close of 1876 there were in 25 states and the Territory of Wyoming 338 rolling mills, containing 4488 single puddling furnaces, each double furnace being counted as two single furnaces. Of the whole number of mills, 260 were in operation during the whole or a part of the year. Of the whole number, 98 were built to make rails—60 heavy and 38 light rails; and of these, 40 heavy and 16 light rail mills—56 in all—made rails in 1876. The rolling mill capacity of the country, like its blast furnace capacity, is at least double the production of 1876.

The production of rails of all kinds in the United States, from 1849 to 1876, has been as follows, in net tons:

Years.	Net tons.	Years.	Net tons.
1849	24,318	1863	275,768
1850	44,083	1864	335,369
1851	50,603	1865	356,292
1852	62,478	1866	430,778
1853	87,864	1867	462,108
1854	108,016	1868	506,714
1855	138,674	1869	593,586
1856	180,018	1870	620,000
1857	161,918	1871	775,733
1858	163,712	1872	1,000,000
1859	195,454	1873	890,077
1860	205,938	1874	729,313
1861	189,818	1875	792,512
1862	213,912	1876	879,629

The following table shows the production in net tons of rails of all kinds in the United States from 1871 to 1876, arranged by states:

STATES in the order of their rail production in 1876.	1871.	1872.	1873.	1874.	1875.	1876.	Per'tage of the whole product made in each State in 1876.
Pennsylvania	385,604	449,113	398,523	259,388	295,156	353,925	40·24
Illinois	91,178	107,496	196,102	125,113	188,248	181,490	20·63
Ohio	78,789	138,165	180,996	83,561	91,775	100,799	11·46
New York	87,092	86,519	59,764	46,979	82,960	57,396	6·52
Indiana	19,778	28,893	26,679	20,617	23,309	20,853	2·34
Wisconsin	9,667	14,690	18,973	19,693	18,250	21,204	2·41
Tennessee	28,274	37,284	39,495	24,017	17,896	20,903	2·43
Missouri	8,200	15,500	14,690	22,048	30,619	29,988	3·34
Maryland	44,941	80,533	42,326	48,048	38,403	21,980	2·41
Kansas				2,000	5,000	14,787	1·68
Wyoming Territory					7,000	12,320	1·40
Vermont				10,400	18,201	9,061	1·03
Massachusetts	6,088	34,094		24,755	6,204	9,183	1·04
Georgia	8,273	6,980		16,061	6,500	9,000	1·02
California	7,840	20,242		7,016	8,073	8,629	·98
Maine	435			4,650	4,050	7,500	·85
Michigan	16,500	4,433		2,448		1,600	·18
Kentucky	14,000	9,868	11,886	6,068	5,851	1,524	·17
West Virginia	5,000	7,490	4,000	522	406	538	·06
New Jersey		20,150	13,749	3,537	941	843	·03
Total	775,739	1,000,000	980,077	729,413	792,512	879,629	100·00

PRODUCTION OF CUT NAILS AND SPIKES IN 1876.

Sixty-four rolling mills in 13 states made cut nails and spikes in 1876. The number of machines contained in these mills was over 3800, although the whole number were not employed. The total production of cut nails and spikes in 1876 was 4,157,814 kegs, against 4,726,881 in 1875, 4,912,180 in 1874, and 4,024,704 in 1873. The American keg of nails weighs 100 pounds; this we mention for the benefit of our foreign readers.

PRODUCTION OF BAR, ANGLE, BOLT, ROD, HOOP, PLATE AND SHEET IRON IN 1876.

Having referred to the production of rails and nails, there remain of the total rolled iron product of the country the above named specialties, and it is curious to observe how uniform their production has been during the past four years, the first year being the year of the panic and the year of greatest production of these forms of iron. In 1873 their production was 875,133 net tons; in 1874, 864,538 tons; in 1875, 861,524 tons; in 1876, 834,211 tons.

PROBABLE CONSUMPTION OF ROLLED IRON IN LATE YEARS.

The probable consumption of all rolled iron, except rails, from 1871 to 1876, is given in the following statement:

Commercial movement.	1871. Net tons.	1872. Net tons.	1873. Net tons.
Production	710,000	941,992	1,076,368
Importation	148,032	112,788	81,675
Total supply	858,032	1,054,780	1,158,043
Exportation	233	527	541
Total consumption	857,799	1,054,253	1,157,502

Commercial movement.	1874. Net tons.	1875. Net tons.	1876. Net tons.
Production	1,110,147	1,097,867	1,042,101
Importation	35,090	28,481	28,569
Total supply	1,145,237	1,126,348	1,070,670
Exportation	4,925	9,698	3,559
Total consumption	1,140,312	1,116,655	1,067,111

The following table will show the production, importation and probable consumption of rails in the United States in the ten years from 1867 to 1876:

Calendar Years.	Made in United States. Net tons.	Imported. Net tons.	Probable consumption. Net tons.
1867	462,108	163,049	625,157
1868	506,714	250,081	756,795
1869	593,586	313,163	906,749
1870	620,000	399,153	1,019,153
1871	775,733	Iron, 515,000; Steel, 50,701	1,341,434
1872	1,000,000	Iron, 381,064; Steel, 149,786	1,530,850
1873	890,077	Iron, 99,201; Steel, 159,571	1,148,849
1874	729,413	Iron, 7,796; Steel, 100,486	837,695
1875	792,512	Iron, 1,912; Steel, 16,316	810,770
1876	879,629	Iron, 287; Steel, none	879,916

PRODUCTION OF BESSEMER STEEL IN 1876.

Eleven Bessemer steel establishments were in operation in the United States in 1876, of which five were in Pennsylvania, three in Illinois and one each in New York, Ohio and Missouri. The Vulcan, at St. Louis, did not go into operation until September, 1876. Of the others it may be said that some of them, if not all, could have made a larger product than they did if orders had been more abundant. It is probable that the Bessemer product of 1877 will considerably exceed that of 1876. The number of net tons of pig iron and spiegeleisen converted by the Bessemer process in 1876 was 539,474, against 395,956 tons in 1875 and 204,352 tons in 1874. Of spiegeleisen alone there were used 45,980 net tons in 1876, against 53,245 tons in 1875. The number of net tons of Bessemer steel ingots produced in 1876 was 525,906, against 375,517 tons in 1875 and 191,933 tons in 1874. The number of net tons of Bessemer steel rails produced in 1876 was 412,461, against 290,863 tons in 1875 and 144,944 tons in 1874. In the 10 years during which the Bessemer steel industry of this country may properly be said to have had an existence, there has been produced a total of 1,163,028 net tons of steel rails. It has really had a slow growth until within the last few years, but it is to-day a leading branch of the iron industry of the country. In 1876 it consumed one-fourth of the total pig iron product of that year, and produced more tons of steel rails than the country had produced of iron rails in any year prior to 1866. The number of Bessemer converters in use in 1876 was 22.

The number of net tons of spiegeleisen produced in this country in 1876 was 6616, against 7832 tons in 1875. W. P. Ward, of Cartersville, Ga., made 100 net tons of ferro-manganese in 1876. The use of ferro-manganese in the Bessemer process is rapidly increasing in this country. If compelled by necessity, we could, upon short notice, make all our own spiegeleisen and ferro manganese, as we have long made all our own Bessemer pig iron.

Full details of the Bessemer steel industry in this country for 1874, 1875 and 1876 are as follows:

Details of P'duction.	1874. Net tons.	1875. Net tons.	1876. Net tons.
Pig iron and spiegeleisen converted	204 352	395,956	539,474
Ingots produced	191,933	575 517	525,906
Rails produced	144,944	290,863	412,461

As we have previously explained, the Bessemer steel produced which is not rolled into rails is used in various forms as a substitute for wrought iron or other kinds of steel. Every indication points to an increase of this use of Bessemer steel. The production of Bessemer steel rails in this country since 1867, when they were first made upon orders, has been as follows:

Years.	Net tons.	Years.	Net tons.
1867	2,550	1873	129,015
1868	7,225	1874	144,944
1869	9,050	1875	290,863
1870	34,000	1876	412,461
1871	38,250		
1872	94,070	Total	1,163,028

PRODUCTION OF STEEL OTHER THAN BESSEMER IN 1876.

Forty-seven establishments made crucible, puddled, blister and open hearth steel in the United States in 1876. These establishments were located in New Hampshire, Massachusetts, Connecticut, New York, New Jersey, Pennsylvania, Ohio, Maryland and Tennessee. There are also steel works in Rhode Island, Georgia, Kentucky and Illinois, but they were not in operation last year.

The total production of 1876 of all the kinds of steel named above was 71,178 net tons, against 61,058 tons in 1875, and 49,681 tons in 1874. Of the product of 1876, 39,382 tons were crucible steel, 21,490 tons were open hearth steel, and 10,306 tons were puddled and blister steel. The table below shows the production by states of the various kinds of steel in 1876:

Districts and States Making Steel in 1876.	Crucible Steel. Net tons.	Puddled, Open Hearth and Blister Steel. Net tons.	Total. Net tons.
New England	1,098	6,085	7,183
New York	2,300	139	2,439
New Jersey	6,806	654	7,460
Pennsylvania	28,217	15,148	43,365
Ohio	700	9,558	10,258
Maryland and Tennessee	261	214	475
Total	39,382	31,796	71,178

The production of open hearth or Siemens-Martin steel made but slow progress in this country until 1872, when 3000 net tons were produced. In 1873 the production amounted to only 3500 tons; in 1874 it reached to 7000 tons; in 1875 to 9050 tons; and in 1876 it jumped to 21,490 tons, the product of 10 establishments.

The following is a table showing in net tons the total production in this country of all kinds of steel other than Bessemer during the past 12 years:

Years.	Net tons.	Years.	Net tons.
1865	15,262	1871	37,000
1866	18,973	1872	40,000
1867	19,000	1873	52,000
1868	21,500	1874	49,681
1869	23,000	1875	61,058
1870	35,000	1876	71,178

PRODUCT OF FORGES AND BLOOMARIES IN 1876.

In the United States the above terms are often used interchangeably, but we have found it most convenient to adopt the New York nomenclature, forges in that State embracing establishments which make iron direct from the ore. Necessarily this classification reverts all establishments which make blooms from pig and scrap iron to another class, and we have, therefore, designated them as bloomaries. Blooms and billets from ore are mainly made in the Champlain district of New York; blooms from pig and scrap iron mainly in Pennsylvania. The make of each product in the last four years is given below in net tons:

Kind of Product.	1873.	1874.	1875.	1876.
Blooms and billets from ore	Tons. 32,863	Tons. 36,450	Tons. 24,416	Tons. 20,784
Blooms from pig and scrap iron	29,701	25,220	24,872	23,844
Total	62,564	61,670	49,243	44,628

The production of both products since 1865 has been as follows. The figures show a steady decline since 1868:

Years.	Net tons.	Years.	Net tons.
1865	63,977	1871	63,000
1866	73,555	1872	58,000
1867	73,073	1873	62,564
1868	75,200	1874	61,670
1869	69,500	1875	49,243
1870	62,259	1876	44,628

IMPORTS OF IRON ORE IN 1876.

The value of the iron ore imported into the United States in 1876 was much less than in some previous years, as will appear by the following table. The number of tons imported in any one year may be approximately ascertained by dividing the value of the imports for that year by two, the invoice value of all the ore that has been imported being about two dollars a ton:

Fiscal Years.	New York.	Boston.	Baltimore.	San Francisco.	Lake Ports.	Philadelphia.	Other Ports.	Total.
1876	12,080	....	....	....	32,446	7,693	673	52,841
1875	16,263	....	....	....	74,495	$55,996	85	146,629
1874	21,544	178	$11,530	....	105,167	....	110	138,514
1873	20,152	$1,484	....	$385	92,595	....	575	194,402
1872	2,116	....	....	....	49,607	....	1,590	53,313
1871	$ 153	....	....	....	66	....	143	362
1870	....	....	....	....	$34,439	....	$165	$34,604

IRON SHIPBUILDING IN THE UNITED STATES.

According to a statement recently placed at the disposal of the New York *Tribune* by the Register of the Treasury, there have been built in the United States since 1866, for American owners, 251 iron vessels of all sizes, having a total measurement of 197,500 tons. About 150 were vessels of good size. They rank as follows:

Less than 100 tons 57	From 3000 to 4000 tons 8
From 100 to 500 tons...73	Over 5000 tons..... 2
From 500 to 1000 tons 41	
From 1000 to 2000 tons.61	Total.....251
From 2000 to 3000 tons. 9	

The following table exhibits the iron tonnage built in the United States in each fiscal year, ending June 30, since 1868, as reported to us by the Register of the Treasury. We have no report of the number of iron vessels built prior to 1871—only the tonnage is reported—but the figures quoted above from the New York *Tribune*, which cover the period from 1866 to 1876, are doubtless correct.

Kind of vessels.	1868. Tonnage.	1869. Tonnage.	1870. Tonnage.	1871. No.	1871. Tonnage.	1872. No.	1872. Tonnage.
Sailing	None	1,059	679	....	2,067	....	None.
Steam	2,801	3,545	7,602	20	13,412	20	12,766
Total	2 801	4.584	8,281	20	15,479	20	12,766

Kind of vessels.	1873. No.	1873. Tonnage.	1874. No.	1874. Tonnage.	1875. No.	1875. Tonnage.	1876. No.	1876. Tonnage.
Sailing	....	None.	....	None.	....	None.	....	None.
Steam	26	26,548	23	33,097	20	21,632	25	21,346
Total	26	26 548	23	33,097	20	21,632	25	21,346

Of the 25 vessels built in the fiscal year 1876, 2 vessels, aggregating 139·78 tons, were built at Buffalo; 1 vessel of 12·99 tons was built at Burlington, New Jersey; 11 vessels, aggregating 11,980·94 tons, within the jurisdiction of the port of Philadelphia; 9 vessels, aggregating 8298·08 tons, in the State of Delaware, and 2 vessels, aggregating 915·12 tons, at New Orleans. At the present time there are building, or under contract, on the Delaware River, 9 large iron steamships of the best class, ranging from 1800 to 2500 tons burden, including two monitors for the United States government, beside a number of powerful iron tugs of 200 or 300 tons burden, and other small craft.

IMPORTS AND EXPORTS OF IRON AND STEEL IN 1876.

The tables of American imports and exports of iron and steel during 1876 and a few previous years will be found elsewhere in this report. During the year ended December 31, 1876, we imported iron and steel products aggregating $10,584,126 in value, against $15,264,131 in 1875, $24,578,638 in 1874, $45,764,670 in 1873, $61,724,227 in 1872, and $47,919,926 in 1871. Tin plate is not included in these figures. In the year ended December 31, 1876, we exported iron and steel products of domestic manufacture aggregating $15,997,643 in value, against $20,417,635 in 1875, $20,458,732 in 1874, $16,687,754 in 1873, $14,360,617 in 1872, and $15,206,179 in 1871. The decline in our imports since 1872 has been very great, but our exports have practically remained stationary during the past six years. The hopes that have been indulged by many persons that this country would soon enjoy a large export trade in iron and steel products, have not been realized, and the principal reason why they have not been realized is due to the fact that other leading iron producing countries still manufacture the coarser forms of iron and steel cheaper than we do. But there are other forms of iron and steel that we could introduce more largely than we do into foreign markets in successful competition with foreign manufacturers, and we repeat the remark we have heretofore made, that the way to extend our markets and increase our sales abroad is to display more commercial enterprise and tact than has been customary with American iron and steel manufacturers. They did not turn to best account the advantages presented by the Philadelphia Exhibition for increasing their foreign trade; they should not neglect similar advantages which will be afforded them by other exhibitions in foreign countries. And they should not be so slow as they have been to co-operate with others in endeavoring to to impress upon the government the necessity of assisting its citizens to establish lines of steamers or sailing vessels between this country and such other countries as would be likely to buy our surplus iron and steel and other products.

During the year 1876 we did not import a single steel rail; in 1873 we imported 159,571 net tons. Our imports of iron rails in 1876 amounted to only 287 tons; in 1871 they amounted to 515,000 tons. While these results are gratifying, it is nevertheless a source of mortification that we should last year have bought abroad ten million dollars worth of pig iron, bar iron, steel, etc., which our own iron and steel makers could have manufactured with the help of idle workingmen. So long as it is possible to import into this country ten million dollars worth of foreign iron and steel in a year of such great industrial depression as last year, so long will a protective tariff be a necessity to American iron and steel interests, and to every American citizen whose prosperity does not depend upon the sale of foreign goods.

PRICES OF IRON IN THE UNITED STATES FROM 1873 TO 1876.

The following tables show the decline which has taken place in the prices of four leading products of our iron industry during the past four years, which embrace the period immediately preceding the panic of September 19, 1873, and extending to the present time. The ton quoted is the gross ton of 2240 pounds:

Months.	No. 1 Anthracite Foundry Pig Iron at Philadelphia. 1873. Per ton.	1874. Per ton.	1875. Per ton.	1876. Per ton.
January	$45·16	$32·00	$25·66	$23·25
February	48·00	32·00	26·50	23·00
March	48·37	32·00	27·00	23·0
April	47·75	32·00	27·00	22·75
May	46·00	31·50	26·50	22·00
June	45·00	31·50	26·00	22·00
July	43·75	31·50	26·00	22·00
August	43·50	31·00	26·00	22·00
September	42·50	29·50	25·00	21·75
October	38·00	29·00	24·60	21·75
November	33·00	26·25	23·75	21·50
December	32·50	24·00	23·50	21·25

Months.	Refined Bar Iron at Philadelphia. 1873. Per ton.	1874. Per ton.	1875. Per ton.	1876. Per ton.
January	$96·32	$73·92	$62·72	$56·00
February	94·08	73·92	60·48	52·64
March	96·32	71·68	62·72	52·64
April	94·08	71·68	62·72	52·64
May	94·08	67·20	62·72	52·64
June	91·84	67·20	62·72	52·64
July	85·12	62·72	62·72	52·64
August	82·88	67·20	60·48	52·64
September	80·64	67·20	60·48	50·40
October	76·16	67·20	60·48	50·40
November	73·92	62·72	56·00	50·40
December	71·68	62·72	56·00	49·28

Months.	Bessemer Steel Rails at Works. 1873. Per ton.	1874. Per ton.	1875. Per ton.	1876. Per ton.
January	$121·00	$117·50	$71·00	$67·00
February	120·00	117·50	71·00	65·00
March	122·50	115·00	71 00	62·00
April	120·25	98·66	69·00	62·00
May	120·00	98·33	69·00	62·00
June	121·75	96·25	69·00	60·00
July	121·75	91·00	69·00	59 00
August	121·75	89·25	69·00	59·00
September	118·60	78·25	69·00	56·00
October	120·00	78·25	67·00	54·00
November	130·00	75·66	65·00	53·00
December	130·00	75·66	65·00	52·00

Months.	Best Iron Rails at Philadelphia. 1873. Per ton.	1874. Per ton.	1875. Per ton	1876. Per ton.
January	$83·33	$66·00	$50·00	$48·50
February	83·00	64·00	50·00	45·00
March	83·00	62·00	50·00	42·50
April	82·00	60·00	49 00	42·00
May	80·00	60·00	49 00	42·00
June	78·00	60·00	49·00	41 00
July	76·00	60·00	48·50	41·00
August	75·00	58·00	47·00	41·00
September	75·00	58·00	46·50	40·00
October	70·00	55·00	46·00	40 00
November	68·00	52·00	45·50	39·50
December	66·00	50·00	43·75	39·00

In May, 1877, the price of No. 1 anthracite foundry pig iron had still further declined to $18 50 at Philadelphia, and the price of refined bar iron in the same market to $44·80. In May, 1877, the price of best iron rails had fallen to $37 at Philadelphia, and the price of Bessemer rails at the works to $48 and $49. These are as low prices as the country has ever known.

There is a lesson told by the foregoing tables of prices which ought not to be overlooked by those who make the laws of this country, and we hope that it will not be. It is this: The manufacturers who have made such great sacrifices as are here shown, and the large numbers of underpaid workingmen who have shared in these sacrifices, deserve friendly and not unfriendly consideration. The legislator, or the college professor, or the schoolmaster, or the hired attorney, or the trader who owes allegiance to no country, but lives among us, or the cabinet minister, who would take one step that would render more difficult the task of these manufacturers, and more grievous the burdens of these workingmen, is not wise. Now that all our industries are in such great need of a healthy revival of old-time activity and prosperity, it should be the policy of all good men to let them alone, and not to handicap them by extending encouragement to foreign manufacturers to enter our markets.

WROUGHT IRON PIPE TUBING.

Fifty Per Cent. Less than by any other Process.

ONE-HALF INCH DIAMETER UP TO THREE FEET IN DIAMETER, OF ANY THICKNESS AND OF ANY LENGTHS.

No Competition in the States of California, Nevada, Arizona, Colorado, Montana, Idaho, New Mexico, Wyoming, Oregon, Utah and Washington Territory.

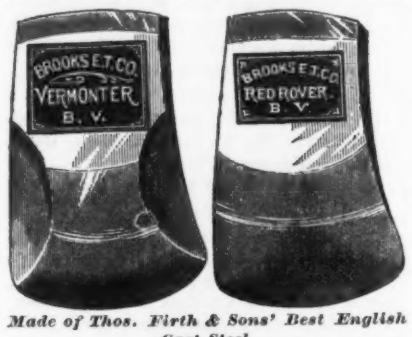
We will sell the patent right to manufacture Wrought Iron Pipe, or Tubing spirally formed, in all of the above States, Canada and South America under J. B. Root's patents for locking, riveting and welding spirally formed pipe or tubing, which is especially adapted for Water Pipe and for transportation into interior of countries, and where light weight and strength are combined with the requisite pressure. The purchase will include Three Machines for manufacturing this kind of pipe; one Locking Machine, which will lock pipe tight spirally from 1–2 inch to 6 inches diameter, No. 20 w. g. to No. 30 w. g., of any length, with a capacity of 10,000 feet daily—one man only required to work machine. Second machine will rivet sheet iron pipe spirally from 6 inches to 12 inches diameter, No. 16 w. g. to No. 30 w. g., of any length—one man to work it. Third machine will rivet sheet iron pipe spirally from 12 inches to 36 inches diameter, No. 10 w. g. to No. 30 w. g., of any length—two men to run it. The production of the riveters is nearly equal to the locking machine.

The machines are small and portable, and the sheets are fed into them on a reel and the pipe spins out very rapidly to 100 feet lengths or longer, if required, without breaking joints, and will stand a water pressure equal to pipe made 30 per cent. thicker, owing to this spirally formed tubing being wound or formed over a mandrel to a perfect circle, and is very stiff throughout the entire length of the pipe, by the lapping. The saving in labor, weight of material and transportation on this kind of pipe is fully 50 per cent., if not more, over butt-welded or lap-welded pipe of the same diameter, and it will readily commend itself to parties on the Pacific Coast, and where light pipe combined with strength is wanted for transit into the interior. The Pipe is easily and readily connected.

The machines and patent right to manufacture as aforesaid stated will be sold for $100,000, cash, or negotiable paper, and 5 per cent. commission on sales of the pipe.

The Abendroth & Root Mfg. Co., No. 28 Cliff St., New York, are now running their works to their utmost capacity on this pipe for the Eastern markets, where specimens of the pipe may be seen and further information will be given as to the various purposes and uses that the pipe may be adapted for.

Address **THE GLOBE ROCK DRILL AND MOTOR CO.,**
No. 167 Tremont Street, Boston, Mass.



Made of Thos. Firth & Sons' Best English Cast Steel.

C. E. JENNINGS & CO.,

Office and Depot for

J. L'Hommedieu Ship Auger Works,

MANUFACTURERS OF

AUGERS AND AUGER BITS for SHIP BUILDING, BRIDGE BUILDING and RAILROAD USE.

ALSO FOR

THE BROOKS EDGE TOOL COMPANY,

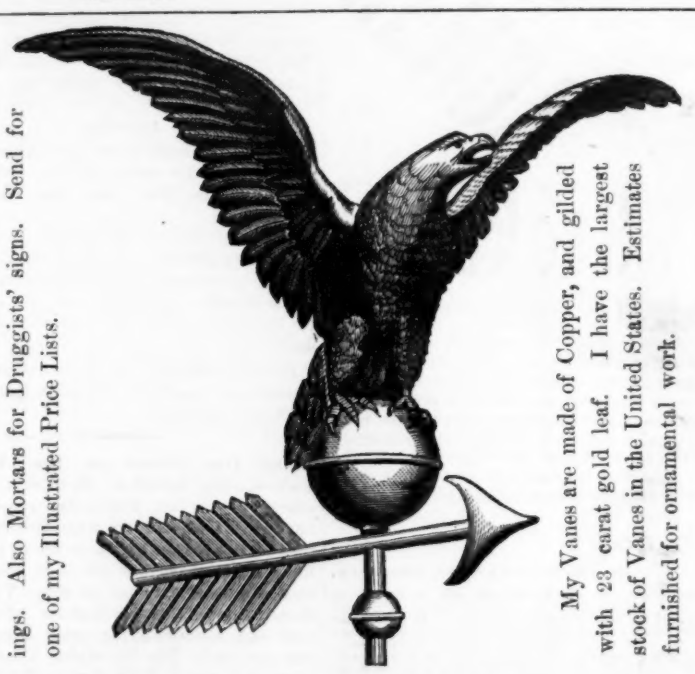
Manufacturers or Axes, Hatches, Adzes and other Edge Tools.

Full prices and Lists of our other goods furnished on application.

No. 98 Chambers Street, New York.

All Patterns and Weights in stock at our New York Warehouse.

Weather Vanes of every description, made from drawings. Also Mortars for Druggists' signs. Send for one of my Illustrated Price Lists.



My Vanes are made of Copper, and gilded with 23 carat gold leaf. I have the largest stock of Vanes in the United States. Estimates furnished for ornamental work.

V. W. BALDWIN, 213 Pearl Street, N. Y.

Manufac urer of

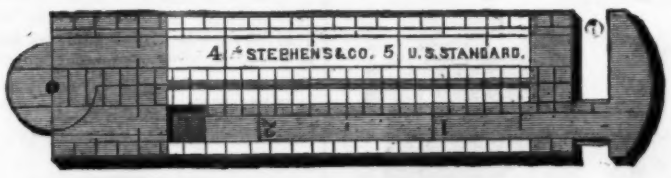
COPPER WEATHER VANES,

Emblematic Signs, Etc.

Established 1854.

STEPHENS & CO.,

Manufacturers of U. S. STANDARD BOXWOOD and IVORY RULES.



Also Exclusive Manufacturers of **L. C. Stephen's Patent Combination Rule.**
Rules graduated in foreign measure to order. *RIVERTON, CONN.*

Towne's Pat. Liquid Bronze, in all Colors & Shades.

Patented 1870, 1873 and 1874; Improved 1875 and 1877. **ARTHUR TOWNE, Patentee.**

For Bronzing all goods, whether of metal, plaster or wood, viz: Picture frames, ornaments, steam and gas fixtures—in fact, iron goods and wares of every description. Is easily applied by anyone. For striping it has no equal. The Post Office and Custom House in Boston and New York Custom House were decorated with this liquid. For yacht and vessel bottoms it has no equal, having been used by the Boston Yacht Club the past four seasons, beside many others too numerous to mention.

ARTHUR TOWNE, Proprietor and Patentee, *118 Commercial St., Boston, Mass.*

Send $1·00 for sample package, express paid through. Agents wanted.

BAEDER, ADAMSON & CO.,

Manufacturers of SAND & EMERY PAPER & EMERY CLOTH.

(Also, in Rolls for machine work.)

Ground Emery, Corundum & Flint, Glue & Curled Hair, Hair Felt, & Felting for Covering Boilers, Pipes, &c., Cow Hide Whips.

Stores: PHILADELPHIA, 730 Market St., NEW YORK, 67 Beekman St., BOSTON, 143 Milk St., CHICAGO, 182 Lake St.

THE VICTOR ROCK DRILL.

With this machine two men can do the work of six or eight by hand. Since it has become known at the Centennial Exposition it is being sent throughout the world. One party has already given an order for 25 machines.

For machines or agencies address

W. WEAVER,
Phœnixville, Pa.

"TORREY'S DOOR SPRINGS"

AND Ice Cream Freezers.

P. R. DUNNE,
Successor to E. T. & T. TORREY,
SOLE MANUFACTURER,
182 Fulton St., New York.

Thomas B. Harkins
Bristol, Pa., Manufacturer of

The Ball Tuyere Irons
AND
TIRE BENDERS.

FINE GRAY CASTINGS of all kinds made to order.

ESTABLISHED 1830.

WM. HASSALL,

Manufacturer of

American and French

Wire Nails

With Flat, Round, Oval, Depressed, Screw and Fancy Heads.

Molding and Finishing Nails, with or without heads. **Brush Makers', Upholsterers' and Undertakers' Finishing Nails** a specialty. **Shoe Nails of Brass and Iron. Bright Iron Rivets. Brass and Iron Escutcheon Pins,** with flat, round and fancy heads, all sizes on hand and to order.

OFFICE AND WORKS: *Nos. 63 & 65 Elizabeth Street, New York.*

THE AMERICAN WIRE NAIL CO.,

Manufacturers of

Molding, Trimming, Upholstering & Finishing Nails, Escutcheon Pins and Wire Nails

Of all kinds and sizes, with Flat, Oval, Depressed, or Countersunk Heads, with or without points.

Warranted Well Made and of Superior Quality.

Lock Box 853. **OFFICE AND WORKS, Covington, Ky.**

THE

FLORENCE OIL STOVE.

For Heating or Cooking.

The Cook, with Baker.

TWO STOVES IN ONE.

Safe, Odorless and Durable.

Can be used without chimney-flues, as it generates no smoke or noxious gases.

Meats and Bread cooked by this stove are better flavored and more digestible than when cooked by coal or wood.

THE HEATER furnishes an abundant supply of pure, moist heat, easily regulated to any desired temperature.

The **FLORENCE** received the **only** Centennial Medal awarded to Oil Stoves. *Report of the Judges*: "It is simple in construction, easily managed, and well adapted to its intended purpose."

MADE BY THE

FLORENCE SEWING MACHINE CO.
FLORENCE, MASS., Manufacturers of
THE BEST SEWING MACHINES.

General Agencies—**39** Union Square, New York; **170** Washington St., Boston; **60** Lake St., Chicago.

Agents wanted everywhere.

DROP FORGINGS

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Special Machinery.

Hardware & Tools and Specialties in Metals manufactured to order.

HULL & BELDEN CO., Danbury, Ct.

STEARNS MFG. CO.,

ERIE, PA., Manufacturers of

Engines, Boilers and Saw Mill Machinery.

Send for illustrated circular.

EQUAL TO THE BEST IN THE WORLD AND LOWER IN PRICE.

Southwark Hardware Co.

MANUFACTURERS.

Steel Bearing

COUNTER SCALES

ALSO

Medium & Common Grades.

Send for illustrated catalogue.

STORE & FACTORY,

S. E. Corner Second St. & Washington Ave.,
PHILADELPHIA.

HAMMOND'S Window Springs

Support and lock sashes of all kinds and sizes; are very convenient, simple and durable; are easily and quickly operated, and **always sure** to hold sashes in most desirable positions. Lower spring can be used in connection with a sash having weights, as a lock. For sale by most Philadelphia wholesale houses. Samples mailed for 10c. Circulars give **6 cuts and full instructions.**

W. S. Hammond,
Lewisberry,
York Co., PA.

INDUSTRIAL ITEMS.

MASSACHUSETTS.

Estus Lamb, of Providence, has sold his machine and scythe works, at Millville, including the fixtures and a 100 horse-power Harris-Corliss steam engine, to Benjamin Booth and J. A. Kidd.

A co-operative foundry company, called the Leonard Co-operative Foundry Company, has been organized at Taunton. It comprises about thirty members, all practical workmen, who intend to devote their time to the business. They have invested a capital of $25,000 in the purchase of the buildings, molds, flasks and other property of the appointed foundry at less than a third of the original cost, reserving a portion for working capital.

The United States Lock Company will remove from Kingston to Plymouth, if the inhabitants of that town will take $40,000 in stock.

The "Lowell Tin and Iron Company" has just been formed at Lowell with a capital of $15,000. The business will consist in separating tin from iron, under a patent which was recently issued.

The Tucker Manufacturing Company have completed about 600 iron doors for the new State Prison at Concord.

The Spencer Wire Company have bought the whole property connected with R. Sugden & Co.'s Wire Works, the transfer to take effect July 1, when the business will be carried on by the wire company, with Richard Sugden as president.

All work at the Armory, Springfield, is now closed; a detachment of soldiers are to be sent on to take the place of the watchmen.

MARYLAND.

The Mount Savage Fire Brick Works are running full on orders.

PENNSYLVANIA.

The Jefferson Furnace, Auburn, is to have one of Weimer's high speed blowing engines.

The Baldwin Locomotive Works have shipped to Australia the first locomotive ever exported to that country from the United States.

At the steam forge of Messrs. Seyfert, McManus & Co., Reading, iron links weighing 7⅛ tons each are being made for use at a huge cotton press. Each link is 27 feet long and made of bars of iron 8¾ inches square, with the exception of the ends of the links, where the iron is 11½ inches thick.

Eckert & Bro.'s No. 1 Furnace, Reading (45x12), is making 150 tons of iron a week.

The Union Forge, Lebanon, is working double turn.

The Weimer Machine Works, Lebanon, received from Mr. F. M. Lloyd, of Wood Green, Wednesbury, England, two of Mr. Lloyd's patent spray tuyeres for furnace service. Mr. Weimer has associated himself with Mr. Lloyd in the patent for this tuyere, and will conduct the American business connected with it.

The old National Iron Works, Danville, have been repaired so as to prevent them from decay, but not to go into operation at present.

The plate and puddling departments of C. L. Bailey & Co.'s mill, Harrisburg, are on double turn, and the nail department single turn.

Joanna Furnace is in full blast.

The firm of William M. Kaufman & Co., of the Sheridan furnaces, has been dissolved by the withdrawal of Messrs. Henry B. Grubb and Charles B. Grubb. The new firm is now composed of Messrs. William M. Kaufman, Zach. M. Kaufman and E. Burd Grubb, and will continue to do business under the old firm name of William M. Kaufman & Co.

PITTSBURGH AND VICINITY.

The receipts of unmanufactured iron and iron ore in Pittsburgh in the periods given were as follows:

	May, 1877.	May, 1876.	April, 1877.
Pig iron	17,178	25,258	20,778
Scrap iron	4,781	4,732	5,585
Blooms and muck bar	1,440	971	230
Iron ore	17,830	16,845	16,030

Taking the five months of the present year the receipts of raw iron have been larger than in the corresponding portion of last year.

The Leechburgh Mill is again in operation.

Lewis, Oliver & Phillips are about to erect two large fans at their lower mill, to supply blast for their boiling furnaces.

The Superior Rail Mill, in the Ninth ward, Allegheny, owned by Harbaugh, Matthias & Owens, was sold at sheriff's sale on a bond and mortgage for $11,664. The appraised value was $95,000. Messrs. John M. Kennedy and Alexander Nimick are the purchasers.

One of the owners of the National Tube Works said: "We have 1100 hands employed at the present time in our works, and if we shut down I don't know what these men are to do, and yet we cannot afford to continue manufacturing. All the manufacturers have an overplus stock of goods on hand, the market is glutted, and the prices are down next to nothing."

The firm of MacGowan, Welch & Co., builders and constructors of blast furnaces, etc., has been changed to MacGowan, Wright & Co.

WEST VIRGINIA.

The mill of the Whittaker Iron Works, Wheeling, is again in operation.

OHIO.

Bourne & Knowles, Cleveland, manufacturers of cold pressed nuts, washers, etc., employ 25 or 30 men, and are running comparatively full.

The Cleveland Stove Company are running their foundry with 56 men. All are engaged on piece work.

The Globe Iron Works Company have in operation at their establishment, in Cleveland, 75 to 100 men. They are engaged on repair work mostly. The mammoth copper boiler, designed for the preparation of ship timber in the Boston Navyyard, is about completed. It measures 70 feet in length and is 6 feet in diameter. It will be shipped in four pieces.

It is now somewhat definitely settled that the Hubbard Rolling Mill will resume operations on the 18th inst. The engine and machinery are being repaired, and carpenters are at work fitting up the coal house.

Under the head of "Bridgeport and Martin's Ferry," the Wheeling *Intelligencer* of Saturday says: "The outlook for the thrashing machine business is very flattering. L. Spence shipped twelve by river last Saturday to points in the Southwest, while Hoyle & Bro. have sent out several. Both firms are pushing their works to full capacity. The foundries and glass works report a moderately good state of trade."

The Lane & Bodley Co., manufacturers of hydraulic elevators, engines and other machinery, have recently shipped a car load of mining machinery to Montana. They are now building one of their large power roasting furnaces for New York.

Messrs. Dunn & Dugan, manufacturers of brass castings, Babbitt metal, railroad car and mill bearings, &c., at Cincinnati, have recently published a new catalogue and price list representing their line of brass goods. They have only lately commenced the manufacture of brass goods, and have a reasonable share of work. They are getting up some new patterns for steam and other fittings.

The firm of Thomas & Robinson, machinists, at Cincinnati, has recently been dissolved, J. M. Robinson & Co. succeeding the old firm at No. 50 Central avenue, and manufacturing power, screw, lever and drop presses and dies, cornice brakes, and heavy and light sheet metal folding machines. Messrs. Thomas, Son & Co., having taken the factory building, Nos. 225 and 227 West Second street, are manufacturing the same kinds of machines and wares. Both firms are quite busy.

Mr. Ernst Passe, machinist, at Cincinnati, is quite busy in the manufacture of his patent Universal joiners for steam and foot powers, and patterns, models and mechanics' tools of various kinds.

Last week Brown & Curtis, of Cleveland, entered into special contracts for over $6000 worth of goods. Their new light weight iron shears are in considerable demand, and are proving very effective machines. Their business in barn door hangings is becoming extensive.

MICHIGAN.

On Thursday night, the 31st ult., the entire plant of the Bay Furnace, at Onota, Grand Island, was destroyed by fire.

The Leland Furnace will blow in at once.

INDIANA.

The South Bend Iron Works manufacture the Oliver chilled plows as a specialty. The business was started by Messrs. Oliver & Co., and carried on as a private firm until 1868, when the present company was organized and incorporated with a capital stock of $500,000. They employ 450 hands, and last year manufactured 60,000 plows. They have doubled their product every year for the past six years.

Both mills at Terre Haute are running steadily.

ILLINOIS.

The Chicago Steel Works have a contract to furnish the plow works of Case, Whiting & Co., of Racine, Wis., with 5000 steel plow beams.

The Architectural Iron Works, Chicago, comprising foundry and machine shops, belonging to the estate of Gen. John T. McArthur, are to be sold at assignee's sale, July 8. Bids for the entire works will be received up to that date.

The Belleville Nail Works are about to increase their capacity by the introduction of 24 to 28 new machines.

The Ore Trade on the Western Lakes.—The Ashtabula *News* says: "The receipts of ore last Wednesday amounted to 5400 gross tons, and the total receipts of ore thus far this season have been about 7000 tons. Rhodes & Co. have now on dock some 10,000 tons of ore and 500 tons of coal. They have already shipped this season about 6000 tons of coal, and Andrews & Hitchcock have shipped four cargoes." The Cleveland *Trade Review* of the 6th says: "There were 15,224 tons of iron ore received from Lake Superior at this port during the week ending June 4th. The previous receipts during the the season were 39,654 tons, making the total 54,878 tons. Of the total, 3876 tons came from the Lake Champlain district." The following table, compiled from the *Mining Journal*, exhibits the shipments of iron ore from Lake Superior for the season up to and including Wednesday, May 30:

	Gross Tons.
From Marquette	65,033
" L'Anse	1,371
" Escanaba	49,207
Total	115,611

The following table exhibits the shipments from the Lake Superior region for the season, up to and including Wednesday, June 6:

	Gross tons.
From Marquette	89,928
From L'Anse	6,838
From Escanaba	71,172
Total	167,938

The underground telegraph wires between Halle and Berlin, in Prussia, have proved so successful in their working, that the German Postmaster General has contracted for the laying of underground cables from Berlin to Cologne by way of Potsdam, Magdeburgh, Brunswick, Hanover, Minden, Munster, Wesel and Dusseldorf, the work to be finished by next spring. Workmen are also busy extending the Berlin-Halle line to Leipsic, and six hundred men are now digging the trenches for a line from Mayence, by way of Cassel, to Leipsic. To say nothing of the advantages gained in dispensing with the unsightly and expensive telegraph poles, the new system has the further advantage of not being affected by wind or snow storms or the electricity in the atmosphere.

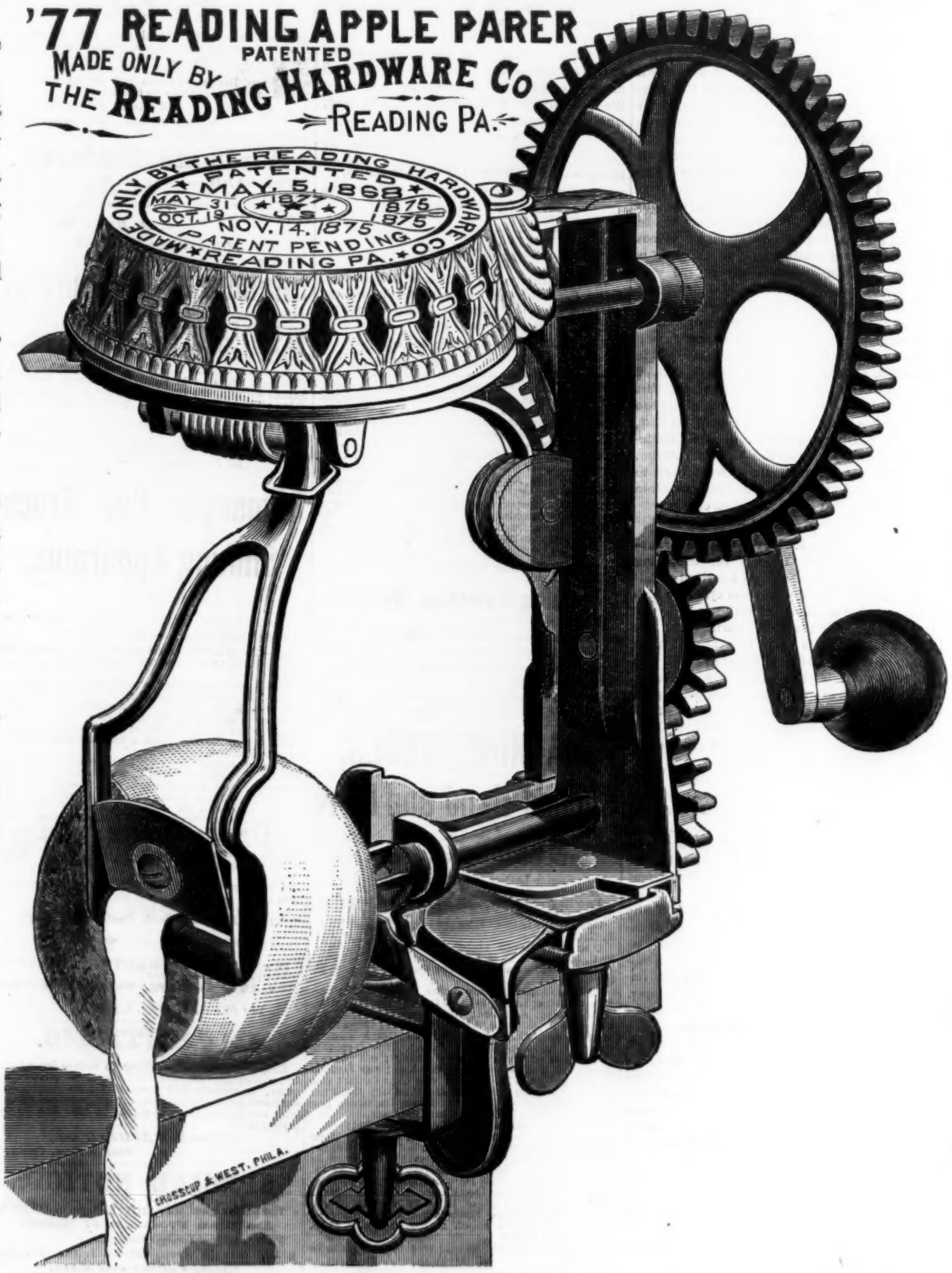
READING HARDWARE COMPANY, Reading, Pa.

Fac-simile of the Centennial Medal awarded by the United States Commission at the Exhibition held at Philadelphia, 1876, to the READING HARDWARE COMPANY, of Reading, Penn.,

For their READING PATENT IMPROVED APPLE PARER, being the only Medal awarded to exhibitors of Apple Parers at the Exhibition, showing its superiority over all others on competition.

'77 UPRIGHT PATENT READING APPLE PARER.

Most Complete Apple Paring Machine Ever Offered to the Public. With all the Latest Improvements.



Among its advantages are the following:

1st. No parings are left on the base of the apple by this machine, the extra knife on the arm removing all remaining after the operation of the principal knife.

2d. It can be secured to any part of the table—front, side or corner—and will still throw the paring clear of the machinery.

3d. The clamps are made heavier, and by the upright position of the machine it is secured more firmly to the table and has more steadiness in operation.

4th. The movement being uniform, it takes off a thinner paring, while the direct action of the push-off lever removes the pared fruit without handling.

5th. The shafts, being square, cannot turn in the wheels of the machine.

6th. Each machine is packed separately in a paper box, rendering it less liable to injury in transportation and better adapted to the wants of the trade.

Reading Hardware Company,

READING, PA.,

MANUFACTURERS OF

DOOR LOCKS

AND

Lock Furniture,

BUTT HINGES,

Axle and Frame Pulleys, Coat and Hat Hooks,

THIMBLE SKEINS & PIPE BOXES,

Together with a Full Line of Japanned, Brass, American, Dark Bronzed AND **Genuine Bronze Metal**

HARDWARE

in all the newest designs and in great variety.

As but a limited quantity of parers will be made the present season, orders should be sent early to be promptly filled. For terms and prices of Parers and other Hardware address

READING HARDWARE COMPANY, Reading, Pa.

New Publications.

THE ELEMENTS OF MACHINE DESIGN. By W. Cawthorn Unwin. 300 pages. Price $1·50.

This forms one of the "Text Books of Science," and is both elementary and advanced in its character. Mathematical formulæ are employed to a considerable extent—in fact, wherever applicable mathematical demonstrations are used, and although the work is elementary in other respects, the student's knowledge of algebra and calculus is supposed to be considerable. The work deals almost entirely with English examples, and in this respect is very valuable. It is very fully illustrated, and the engravings are uniformly good. The practical man will find this work a valuable addition to his library under any circumstances. The work can be obtained from this office.

THE ART OF ELECTRO-METALLURGY. By G. Gore, LLD, F. R. S. 380 pages. Price $2·50.

This work is another volume of the same series, and is perhaps the fullest and most valuable contribution to the literature of electro-metallurgy that has been made in a long time. The author has endeavored to produce a work that will be useful not only to scientific students, but to practical workers in the art of electro-metallurgy, gilders, platers, etc., and in fact to all who wish, in "a compact form, an explanation of the principal facts upon which the art of electro-metallurgy is based." The author describes processes by which almost every known metal can be deposited, as well as most of the individual processes now employed in England. A historical sketch of the development of the art in England is also given. A chapter is devoted to work of a technical character, which is intended for the use of practical operators, including those who have not had the advantage of chemical instruction. There is also a list of some 300 English patents pertaining to the subject, which have been granted since the first one issued to G. R. Elkington, June 24, 1836. The work is one which will repay careful perusal.

ANNUAL RECORD OF SCIENCE AND INDUSTRY FOR 1876. Edited by Spencer F. Baird. 600 pages. Price $2. Uniform with the five volumes from 1871 to 1875 inclusive.

The editor, Spencer F. Baird, is the assistant secretary of the Smithsonian Institute, and has therefore the best possible opportunity for obtaining the information needed for the production of a work of this kind. The subdivisions of the work are the same as those of previous years. It is the aim of the editor to present in this annual an intelligible and popular account of the more important facts of progress in the various departments of physical and natural sciences, as well as their applications to the conveniences and luxuries of mankind. In carrying out this plan there are given summaries of progress in different branches of science; a series of abstracts of special papers or other publications by various authors, with reference to the page, volume, etc.—these are in every case digests in which the aim has been to give the points of novelty and special interest—a list of deaths in scientific circles; a list of the more important publications in science for the year, as a guide for the purchasers of books; an index of authors and subjects, and last a table of contents of the most complete and perfect character.

NORTHERN AND ASIATIC DEFENSES OF TURKEY, with an account of the Military Forces and the Armament of the Belligerents in the Present Eastern War. Two Colored Maps. Price, 50c.

This pamphlet is made up of five papers by C. H. Woodman and one by G. M. Fowle. The sources of information seem to be chiefly English newspapers. The writers evidently consider Turkey much the stronger nation in the present conflict, although they say in conclusion that if the Czar is fighting for the liberty of the oppressed Christians he will, doubtless, win in the end. The maps appear to be very good; they are carefully and clearly engraved, and very neatly colored.

TURKEY AND THE UNITED STATES; HOW THEY TRAVEL THE COMMON ROAD TO RUIN. By Henry Carey Baird. Price, 10c.

The author says that the troubles which afflict both of these countries come from a common cause, which he considers the annihilation of the power of association. The sixteen pages of the pamphlet are devoted to an elaboration of this statement.

HISTORY PRIMERS. GEOGRAPHY. By George Grove, F. R. G. S. Price, 45c.

This little work is an English reprint of some little value, apparently intended for children. From a cursory examination we have hardly been able to see just how it is intended to be used, since it is at once sufficiently elementary for a child of four or five and technical enough for the advanced student. We imagine if Mr. Grove had attempted to teach a child of six the same amount of geography before this work was written he would have produced a very different book. As it is, it is an admirable primer for adults who wish to begin at the beginning for the purpose of teaching children.

GARTH, A NOVEL. By Julian Hawthorne. 290 pages, paper covers. Price, $1.

Julian Hawthorne is too well known among the lovers of good reading to make a recommendation of his work necessary. The story is a good one well told, and is very interesting.

The Abendroth & Root Manufacturing Company have just purchased the extensive foundry and machine shops now occupied by the Keyser Stove Works, bounded by Noble, West and Oak streets, Greenpoint, L. I., into which they will move the manufacturing portion of their business. They have sold their present works to another company, finding they were too small for the manipulation of the spiral tubing branch of their business, lately added to that of their safety boilers and other specialties. The Keyser Stove Works will concentrate their business into the Hunter's Point Foundry.

A Menace of Trouble for Our Iron-masters.

A communication to the Scranton *Times* from Reading, Pa., under date of June 4th, says:

There is a lively prospect of trouble between the iron manufacturers and the operatives in the iron establishments east and west of the Alleghenies.

For some time past the factors of wrought iron goods (who represent the Iron Manufacturers' Association) have been holding private conferences in Pittsburgh and Philadelphia to discuss the situation of the business, which has been greatly depressed for a long time, and consider the advisability of a suspension of operations purposely to curtail production, as well as to reduce the stocks on hand.

An effort was made at the Philadelphia meeting to secure a general suspension for 60 days. The resolution came within one vote of being made unanimous. It requires the entire vote of the members of the association present at a meeting to make a motion for a stoppage of manufacturing complete. Other conferences are to be held in Philadelphia and elsewhere during the week, and it is not in the least improbable that the final decision of the manufacturers will be for a general and complete shutting down of manufacturing for 60 days if not longer.

The movements of the manufacturers are watched with deep interest by the operatives employed in the numerous large and small establishments located throughout the State. While a suspension of work may be adopted by some factors, others may reduce wages and operate their establishments on partial time. Both movements are obnoxious to the employes, and there are indications at various points that the workingmen will inaugurate an open rebellion against either proposition, if carried into effect. The operatives in the iron works of Pennsylvania are strongly organized under the name of the "Sons of Vulcan," and are said to be fully prepared to engage in a strike.

In other sections of the State, where great iron manufacturing interests center, the feeling among the operatives is quite different, being more antagonistic to the proposed shut-down and reduction of wages. West of the Alleghenies, at Johnstown, Pittsburgh, and other places the agreement regulating the compensation of puddlers and others engaged in the iron manufactories expires to-morrow, the 5th inst. It is understood that the manufacturers as an associated body, will not pay the rates for puddling that have ruled for the past year, but will make reduction. What percentage will be deducted from the puddlers' wages is not known, but that a reduction will be made is certain. If the employes accept the new schedule of wages the iron establishments will continue running until July 1, when it is customary for the mill owners to cease operations and take account of stock. In the event of a refusal upon the part of the men to accept the reduction, a complete lock-out will be decided upon by the manufacturers. It is stated that the Pittsburgh puddlers are getting $1 per ton more than is being paid in any part of the East, and the Pittsburgh proprietors claim a reduction is necessary to meet Eastern competition. The workmen, it is understood, are willing to renew the expiring compact, but will enter into no agreement that has a reduction clause.

Copper Facing Rolls for Calico Printing.—Schulmluger's process for coppering rolls used in calico printing is described as follows: He first cleanses the iron cylinders with a concentrated alkaline lye, washes well in water, and goes over the whole surface with the file. The surface is then very bright, and is not to be touched with the finger or soiled with the breath. It is then plunged in an alkaline bath composed of: Sulphate of copper, 1 part, dissolved in water, 12 parts; cyanide of potassium, 3 parts; carbonate of soda, 4 parts; sulphate of soda, 2 parts, dissolved in water, 16 parts. Or, Ammonia, 3 parts; acetate of copper, 2 parts, dissolved in water, 10 parts; cyanide of potassium, 3 parts; carbonate of soda, 4 parts; sulphate of soda, 2 parts, dissolved in water, 10 parts. The cylinder is allowed to remain 24 hours in one of these baths, subject to the action of a battery of 4 or 6 pairs, till the surface is coated with a slender but adherent layer of copper. It is washed and cleansed with pumice stone. If in this operation the iron should be laid bare in any part, the cylinder must be anew submitted to the alkaline bath. As soon as the coating of copper is uniform, it is washed in acidulated water and immersed in an acid bath of sulphate of copper. The bath is composed of a solution of copper at 20° B., to which 1-300 of its volume of sulphuric acid is added to facilitate the solution of some metallic copper, which is also immersed in the bath for the purpose of maintaining the solution in a uniform state of concentration. Here the cylinder is left till the layer of copper has attained the desired thickness, a galvanic current being kept up by a battery of four pairs. If the temperature is between 60° and 65°, three to four weeks are required to produce a deposit of one thirty-third of an inch in thickness. The cylinder is turned one-quarter round daily to change the port on of its surface which faces the sheet of copper used as a positive electrode.

Utilizing the Minerals of India.—The government of India have determined to move with the times with the view of utilizing the iron making materials which they possess in the Central Presidency, where, at Warrora, Mr. Walter Ness, mining engineer, has developed a considerable colliery, and has so well trained the colliers that they are becoming quite proficient in the work of coal hewing, though it still requires four natives to do as much work as is usually done by one collier in England. Mr. Ness' experiments with the very rich iron ore and the limestone which are abundant in the same district, while they have convinced him that they cannot be smelted by the blast furnace, are capable of being used up by one or other of the direct methods which have been adopted, if not in this country, in America. Under the direction of the Government Mr. Ness has shipped nearly 100 tons of coal, iron ore and limestone, and will himself follow it to England by the Bombay mail at the close of this month. At home he will experiment with such systems as may see to him to offer the needed facilities, and if he should not be able to attain all the success he desires in England he will come to America. Mr. Ness will likewise investigate the methods of making patent fuel in the hope of finding some suitable for adoption in India, whither likewise he will, upon his return, take out coal cutting machinery if he should find one applicable to use in the Indian pits.

The imports of iron rails during the nine months ending March 31, 1876, consisted of 590,880 pounds, valued at $9688. No similar imports were reported during the nine months ending March 31, 1877. Of steel rails, the imports during the latter period consisted only of 66,138 pounds, valued at $1464, while during the corresponding period of 1875–76 the imports consisted of 9,953,469 pounds of steel rails, valued at $314,282. The exports of passenger and freight railway cars during the nine months ending March 31, 1876, consisted of 312 cars, valued at $245,132. In the corresponding period which ended March 31, 1877, the number of cars exported was 441, valued at $412,755. The exports of iron or steel rails during the nine months ended March 31, 1876, consisted of 7097 cwts., valued at $26,020. In the corresponding period which ended March 31, 1877, the exports consisted of 93,754 cwts., valued at $216,147. Of car wheels, 4727 were exported during the nine months ending March 31, 1876, valued at $90,768. In the nine months ending March 31, 1877, the number of car wheels exported was 6166, valued at $80,275. Of locomotive steam engines, 41 were exported during the nine months ending March 31, 1876, which were valued at $527,079. During the nine months ending March 31, 1877, 42 locomotives, valued at $469,302, were exported.

Of the total number of Centennial awards, 13,036, citizens of the United States received more than one-third. Portugal and Spain lead the foreign countries. France comes next, with the United Kingdom and Germany nearly abreast. Canada, Italy and Brazil follow in the order named. The lowest number of awards (three) was to Peru, and the next lowest (five) to the Free State of Orange, in Africa.

Trade Report.

Office of THE IRON AGE,
WEDNESDAY EVENING, June 13, 1877.

The Wall street markets have all been sluggish during the past week, and have been devoid of any prominent feature. Money continues abundant, and has gone as low as 1 @ 2 per cent. for call loans, while prime mercantile paper remains at 3 @ 4 per cent.

Gold has ranged lower than for the previous week, with 105⅝ the highest and 104¾ the lowest quotation, there having been a gradual settling down each day. The exports of specie, chiefly gold coin, have been somewhat heavier. The following table shows the daily range of the premium:

	Highest.	Lowest.
Thursday	105⅝	105⅜
Friday	105⅝	105¾
Saturday	105⅞	105½
Monday	105	104⅞
Tuesday	105½	104⅝
Wednesday	105¼	104⅞

Governments continue to sympathize with gold, and have, therefore, declined a point or two from the bidding rates of last week. The market has been quiet, and closes without showing any signs of recovery. There has been a steady tone to state and railway securities, but transactions have been rather small. The quotations of government bonds will be found below.

The stock market has been unsettled on all stocks, and shown a generally heavy tone. The coal shares have suffered a large decline, which has been increased at the close by a further reduction in the auction prices of coal. The Delawares touched the lowest point reached for many years, and it is currently believed that the entire list will yet go lower, as there is little prospect of harmonizing the interests of the different companies, and a general war is threatened with an overproduction and forced sales. Trunk Line Railway shares have been unsettled, because of the uncertainty attending a settlement of the passenger rate difficulties. Quotations of all active stocks are given below.

The last bank statement shows a falling off in the legal tender note average of $821,600, and in the specie average of $402,800, and these together reduce the total reserve $1,224,400. A slight increase in deposit liabilities makes the reduction in the surplus reserve $1,288,525. The surplus reserve, however, is still large—$18,585,175. The following is a comparison of the averages of the New York banks for the past two weeks:

	June 2.	June 9.	Differences.	
Loans	$250,754,400	$251,673,000	Inc..	$918,600
Specie	19,844,500	19,441,700	Dec..	402,800
Legal tend's	55,899,700	55,078,100	Dec..	821,600
Deposits	223,481,600	223,738,500	Inc..	256,900
Circulation	16,143,700	16,162,000	Inc..	18,300

IMPORTS.

For week ended June 9:

	1875.	1876.	1877.
Total for week	$6,286,815	$5,907,450	$6,529,778
Prev. reported	158,841,301	137,365,213	141,952,701
Since Jan. 1	$165,128,716	$143,272,663	$148,482,479

Included in the imports of general merchandise for the week are the following:

	Quant.	Value.
Brass goods	5	$1,727
Bronzes	6	1,050
Chains and anchors	20	950
Copper		7,051
Copper ore		513
Cutlery	49	11,119
Guns	5	1,331
Hardware	13	1,120
Iron, pig, tons	200	3,602
Iron, sheet, tons	16	1,602
Iron tubes	370	609
Iron, other, tons	413	16,655
Lead, pigs	9,350	53,543
Lead, bbls	23	950
Lead ashes, casks	95	3,927
Metal goods	157	10,982
Nails	16	1,438
Needles	12	4,669
Nickel	1	713
Platina	2	5,348
Per. caps	8	842
Saddlery	11	1,109
Steel	2,212	18,277
Spelter	55,118	2,623
Silver ore		1,390
Tin, boxes	27,207	140,373
Tin, 4096 slabs	286,853	44,853
Wire	14	6,919

EXPORTS EXCLUSIVE OF SPECIE.

For week ended June 12:

	1875.	1876.	1877.
For the week	$5,672,819	$6,513,296	$6,023,957
Prev. reported	106,163,505	107,543,338	119,910,044
Since Jan. 1	$110,836,324	$114,056,634	$125,934,001

EXPORTS OF SPECIE.

For week ended June 9:

Total for the week	$1,356,135
Previously reported	15,260,274
Total since Jan. 1, 1877	$16,616,409
Same time in 1876	25,549,171
Same time in 1875	42,566,803
Same time in 1874	24,934,946
Same time in 1873	23,859,519
Same time in 1872	30,499,900

Government bonds close as follows:

	Bid.	Asked.
U. S. Currency 6s	122¼	122½
U. S. 6s 1881, reg	110⅝	110⅞
U. S. 6s. 1881, con	114⅛	114⅜
U. S. 6's. 1865, new reg	106⅛	106⅜
U. S. 6's. 1865, con	109⅛	109⅜
U. S. 6's. 1867, reg	109⅛	109⅜
U. S. 6's. 1867, con	112⅝	112⅞
U. S. 6's. 1868, reg	112⅛	...
U. S. 6's. 1868, con	115⅛	...
U. S. 10-40 reg	112⅛	112½
U. S. 10-40 con	112⅝	113⅛
U. S. 5s. 1881, reg	110⅞	111⅛
U. S. 5s, 1881, con	110⅞	111⅛
U. S. 4½s. 1891, reg	107⅛	107⅜
U. S. 4½s. 1891, con	107⅛	107⅜

The following are the closing quotations of active shares:

	Bid.	Asked.
Atlantic and Pacific Telegraph	18¾	19
Chicago & Northwestern	20⅝	—
" " Pref	44½	44⅝
Chicago, Rock Island and Pacific	91½	91⅝
Chicago, Burlington and Quincy	99¾	100
Clev., Col., Cin. and Indpls	24½	25⅛
Cleveland and Pittsburgh	78¼	80
Chicago and Alton	77⅝	79
" " Pref	100	—
Consolidated Coal	20	24
Canton	—	90
Del., Lack. and Western	32⅛	32¾
Delaware & Hudson Canal	27	27⅛
Adams Express	93	94
American Express	44¾	45⅛
United States Express	42	42⅝
Wells, Fargo & Co. Express	86	88
Erie	6	6¼
Harlem	141	143
Hannibal & St. Joseph	12½	13
" " Pref	23	24
Illinois Central	51½	52
Lake Shore	47	47⅛
Michigan Central	38½	38¾
Morris & Essex	53½	54
Milwaukee & St. Paul	19¾	19⅝
" Pref.	49½	49⅞
Mariposa	1¾	5
" Pref.	2	5
New York Central	92⅛	92⅜
New Jersey Central	6½	7
Ohio & Mississippi	4½	4⅝
Pacific Mail	19	19¼
Panama	95	96
Pittsburgh & Fort Wayne	88	90
Quicksilver	14	14¾
" Pref	21½	22¼
St. Louis & Iron Mountain	5⅞	6¼
St. Louis Kansas City Northern	4	5
" " " Pref.	23½	24½
Toledo, Wabash & Western	1½	1¾
Union Pacific	68¾	69
Western Union Telegraph	60	60¼

GENERAL HARDWARE.

Our review of the Hardware trade for the week must of necessity be rather dull reading, as little has transpired worthy of mention.

The many friends in the trade of J. B. Beadle, late secretary and treasurer of the Meriden Cutlery Company, will be pained to hear of his death, which occurred on the 4th instant, after a long illness. Mr. Beadle has been at the head of the Meriden Cutlery Company and its active manager ever since its organization, and to his faithful service and conservative management is largely due the present high standing of the company. Those who have been associated with him in business testify to the integrity of his character and his high sense of honor. His loss is deeply felt by the company with which he was identified and the community in which he lived.

The Rule Manufacturers' Association held a meeting in Hartford, Conn., to-day, at which it was decided, in view of the increased cost and scarcity of Turkish Boxwood and of Ivory, to advance the prices of their goods. The price of Boxwood Rules was advanced to discount 50 and 10, and Ivory and miscellaneous goods to discount 40 and 10 per cent. These prices, we are informed, are to take effect immediately.

The condition of the Nail market is, if anything, weaker than at our last writing. The general asking price for 10d. is now $2·40, but we do not consider the market a firm one, even at this low figure.

The manufacturers of Iron Wire held a meeting to-day, at New Haven, Conn., but up to the close of business their action, if any, had not transpired.

The price of Newhouse Pattern Game Traps is variously quoted in this market. Some makers inform us that they are firm at discount 45 @ 50 per cent., while others say that orders have been placed at discount 60 per cent., and we hear of large orders accepted at even better figures. The genuine Newhouse Trap is quoted at unchanged figures, viz., discount 25 and 2 per cent.

The Brooks Edge Tool Co., manufacturers of the "Red Rover," "Vermonter," "Forest King" and "Green Mountain" Star Axes, also Hatchets and other edge tools, have established a warehouse in this city at 98 Chambers street, with C. E. Jennings & Co., where they will keep in stock a full line of all goods made by them.

The Security Blind Fast Company, of No. 28 Potter street, Providence, R. I., have recently introduced their new Patent Screw Fast in this market through their agent, A. B. Swift, No. 9 Murray street. The peculiar feature of this Fastener is its operation without any spring, by the ingenious application of a simple mechanical principle, the action of gravity. That it works easily and perfectly, is always reliable and never gets out of order, is claimed by the manufacturers. This company also manufacture the Northup Window Spring, which they claim is the surest and easiest operating Window Spring in use. Working models containing samples of these inventions, will be forwarded to architects, builders and the trade upon application. They quote "Security" Blind Fast, per gross, $14, subject to discount 10 per cent. to regular trade, with an extra discount for quantity orders, and the "Northup" Window Spring at $9 per gross, subject to the same discount.

The attention of the trade is invited to the advertisement of the Southwark Hardware Company, of Philadelphia, on page 17. The S. H. Co. have issued an illustrated catalogue in regard to which they say:

"In presenting the accompanying list of Counter Scales, we desire to state that it is one of if not the most complete list ever offered. At present our manufacture of Scales is confined exclusively to those for counter use, and in addition to various styles of the same size of Scale, we make three grades, thus enabling our customers to supply almost any one who desires a Counter Scale.

"Our *First Grade* is known as the Steel Pivot Scale, and we believe it cannot be excelled by any similar Scale in this country. It works on steel pivots, is fancy painted (usually bright vermillion color), and is handsomely ornamented. The weights accompanying this grade are all regulated and Japanned.

"*Second Grade.*—This grade, known as the 'Diamond' Scale, is an iron pivot Scale, fancy painted, and has, like the first grade (or Steel Pivot Scale), regulated and Japanned weights. Though we are now offering our first grade at a low figure, there is a class of trade requiring a yet cheaper scale, yet one that must present a respectable appearance. The "Diamond" Scale is very nice looking, and works well.

"*Third Grade.*—The [illegible] is our common (all black Japanned) Scale. The weights accompanying this grade are all regulated, but not Japanned."

The Stanley Works have issued the following circular:

Having a full assortment of Stanley's Wrought Iron Butts (Plain, Japanned and Bronzed), Strap and T Hinges, Wrought Door Bolts, &c., on hand, and having purchased from Roy & Co. their entire stock of Wrought Butts and Hinges, both at their factory and in the hands of their agents, we are prepared to execute all orders promptly.

We have recently completed our new works, transferring all of our machinery thereto, making the largest and most complete establishment in the country for the manufacture of Wrought Butts and Hinges. With a capacity (when running full force and time) for producing over four thousand dozens daily of Butts and Hinges, our customers can safely rely upon us hereafter to meet their requirements as to quantity, quality or variety.

THE STANLEY WORKS.

Factories, New Britain, Conn.; Warehouse, 79 Chambers street, N. Y.

H. C. Heinisch, manufacturer of the celebrated R. Heinisch's Sons Shears, &c., has issued the following circular:

NEWARK, June 15, 1877.

Having finished all my contracts on Nickel-plated Shears and Scissors, I am now prepared to fill all orders for that class of goods, and take pleasure in informing my friends that Messrs. Hermann Boker & Co. have a full line of Nickel-plated goods of my manufacture constantly on hand, which they will furnish to the trade at the lowest market prices.

H. C. HEINISCH.

We call attention to the advertisement on last page of J. H. Sternbergh, of Reading, Pa. Mr. Sternbergh makes a specialty of the manufacture of Bolts, Boiler Rivets, Hot Pressed Nuts, &c., and has succeeded in building up a large trade, which, we are informed, extends to every State in the Union as well as to the British Provinces and South America.

We cheerfully give place to the following correction;

PLYMOUTH, Mass., June 7, 1877.

Editor of The Iron Age—DEAR SIR: My attention has been called to a statement in a recent issue of your paper, that I had stopped my works for the summer. As this may produce an erroneous impression much to my injury, I beg you to state that I am running my Rivet department full time; my Tack machines are but temporarily stopped, as I have a good stock of Tacks, Brads and Nails on hand. I am prepared to fill all orders for goods in my line promptly. Yours, respectfully,

SAMUEL LORING.

We invite the attention of manufacturers and capitalists to the advertisement of the Globe Rock Drill and Motor Co., of Boston, Mass., which will be found on the 17th page. This company offer for sale the patent right to manufacture Wrought Iron Pipe, or Tubing spirally formed, together with the necessary machinery, in a number of the Western States and Territories, the particulars of which will be found in the advertisement referred to.

The following circular has been issued by the manufacturers of the new Steel Calked Horseshoes, which have been described in our columns. They are sending these circulars out with trial lots. Some 200 kegs of Shoes have been made for the purpose of having them thoroughly tested:

The Williams' Patent Steel Horseshoe.

PITTSBURGH, Pa., June 9, 1877.

This experimental lot of Horseshoes is presented for trial and testing their value.

Our aim is to make a finished Shoe to suit the trade; one that will be comfortable and long wearing. To this end we invite your criticism, and suggestions if any and all improvements demonstrated by their practical use.

We believe the seven-calked Shoe to be the best, because its bearing points approximate the plain Shoe, and yet give ample hold to prevent slipping, the objection to the uncalked Shoe.

This experimental lot of Shoes was made without the proper machinery for their manufacture and finish. We have now learned what is needed, and in future hope to offer a much better finished Shoe, and one in which any objectionable points will be avoided.

In this lot we may have used steel too high in carbon, in our desire to obtain a long-wearing Shoe.

Should you wish to harden the points of the calks, care must be taken in doing so not to harden the plate or web. We would recommend that the points be laid into water not more than a quarter of an inch deep, and left there until cool. We would especially caution smiths not to cool off the Shoe by plunging in water until after redness disappears in the dark. Please address

E. V. MCCANDLESS, 41 Fifth avenue,
or JNO. R. WILLIAMS, 70 Smithfield street,
Pittsburgh, Pa.

BRITISH IRON MARKET.

(*Specially reported by cable for The Iron Age.*)

WEDNESDAY, June 13, 1877.

Scotch Pig.—The demand has fallen off, and as a consequence prices are somewhat weaker. The following are makers' quotations:

Coltness No. 1	65/
Glengarnock No. 1	59/6
Eglinton No. 1	55/

Manufactured Iron and **Rails** are without change to note.

IRON.

American Pig.—We cannot report the slightest improvement in the condition of any branch of the Iron trade. In American Pig we hear of sales aggregating 1000 tons Nos. 1, 2 and Gray Forge, at $19, $18 and $17 respectively. We hear also of offers of good brands at a trifle under our quotations, and of Allentown No. 1, delivered at the seaboard in 100 ton lots at $19, less 3 per cent., prompt cash. We quote at unchanged figures: Foundry No. 1, $18 @ $19; Foundry No. 2, $17 @ $18; Gray Forge, $16 @ $17.

Scotch Pig.—Sales are reported of 200 tons Coltness and 100 tons Eglinton, to arrive, on terms which have not transpired. Aside from the above the transactions have been within very small limits. We quote: Glengarnock, $27; Eglinton, $25; Coltness, $28·50.

Rails.—We cannot report any [illegible] sales and quote, as before. Steel, $45 @ $47, at Mill, and Iron, $33 @ $36.

Old Rails.—We note the sale of 600 tons Old Rails at $19. We quote $19 as the market price.

Scrap.—The sale of 800 tons No. 1 Wrought at a price equivalent to $23 @ $23·50, from yard, is reported. We quote: No. 1 Wrought, from yard, $23 @ $24.

METALS.

Copper.—Sales during the week have been confined to 300,000 to 400,000 pounds Lake Superior at 19⅛c. @ 19¼c., but the market closes firm at 19⅜c. @ 19½c., bid. Some sales for delivery in July are said to have been made at 19½c., but we understand that more may be had at 19⅜c. Baltimore we call 19¼c., nominally. London telegraphs Chili Bars, £69; Best Selected, £76, and a cablegram is said to have been received quoting Wallaroo £81. The latter was scarce on June 1 at £77 @ £78, and the advance is not unlikely. Fine Copper has all along been comparatively scarce in Europe, while the common descriptions, such as Chili Bars, have been abundant, and after a while the difference in price between the two may become even greater than it is at present, unless the equilibrium should be restored in the meantime, which is far from probable. This circumstance has to a certain extent operated in favor of our own Lake Copper since the very commencement of the year. Its superiority for cartridge and other purposes is more and more acknowledged wherever it has been introduced and fairly tested—a fortunate circumstance for our lake companies, inasmuch as this particular kind of Copper, as well as other descriptions akin to it, are thereby raised above the ordinary trade influences which rule the value of less favored sorts such as Chili Bars. There is still a good sale of manufactures, which we quote 31c. for Sheathing and 32c. for Bolts and Braziers; New Yellow Metal Sheathing, 20c.; Yellow Metal Bolts, 25c.; and Nails, 20c., net cash.

Tin.—This metal has become much weaker again in our market, owing to the near arrival of 5000 slabs expected by steamer out of a total of 25,000 slabs afloat from the Straits. The anxiety to sell to arrive has, therefore, become even greater than it was last week. Meanwhile, the demand for actual consumption is quite moderate. We quote large lines, in gold, as follows: Straits, 16½c. @ 16¼c.; English Refined, 16¼c.; ditto Common, 15⅞c.; and Banca, 18¼c. @ 18⅛c., all gold. Telegraphic accounts have reached us from London reporting a decline in Straits Tin to £68. 5/, since when, according to dispatches received by others, it seems to have rallied to £69. Singapore simultaneously reports a steady market at $19·50 per picul, with an exchange of 4/1. Mail accounts are to hand from London, dated June 1. The London stock was 9522 tons. Australian Tin continued to arrive in large quantities, and the amount afloat was unusually ample. At the same time it was reported from Netherland India that the Tin production of Billiton during the fiscal year ending April 30 proves to have been but 59,532 piculs, against 62,000, 63,000 and 51,000 the previous three years. The alarming feature in the Tin situation remains the excessive Australian output, in the face of which the comparatively trifling deficiency in Billiton counts for very little. The Dutch Banca sale on the 30th ult. averaged 42⅛ guilders the 50 kilos, equal to £72. 10/ at London. Of English Tin the shipments to the United States during May were 250 tons, which in normal times would appear but moderate, but in the present state of dullness here are large enough. Consumers of Tin Plates evince but little confidence in the maintenance of the slight advance established here since makers in England resolved upon a curtailment of production. The consequence is that the market is not lent the support which was counted upon by holders a fortnight ago, the market gradually relapsing into a quiet mood. We quote ordinary brands, large lots, gold, per box, at the close, as follows: Charcoal Bright, $6·75 @ $7; do. Ternes, $6 @ $6·12½; Coke Tin, $5·62½ @ $5·75, and do. Ternes, $5·50.

Lead.—This metal is as flat as ever, sales for the week being limited to 150 tons Sacramento at 5·60c., currency. In common Lead in general only a retail business is doing on the basis of 5⅝c., currency, while for fine Lead the demand is as yet quite restricted, causing prices to be still decidedly in favor of buyers. Soft Missouri is offered at St. Louis at 5⅜c., currency, and the finest selected brands have been sold at New York at 5·90c., currency, and at Philadelphia at 5⅞c., currency. According to accounts from the Lead mining regions production is falling off at present in consequence of the severe decline in value in our home markets. Producers are now making great efforts to reduce expenses in every possible manner, and as freight reduction will also assist them materially in their aim of a considerably cheaper production, it is to be presumed that they will soon be able to resume operations, even upon the present basis of Lead values, with prospects of as good returns as when a couple of months ago the metal commanded a much higher price. We are in possession of telegrams from London of to day, one dispatch from Messrs. Schwann & Co., London, to Mr. Emile Herold, here, quoting Spanish, cost, freight and insurance, £20. 12/6, against £20. 15/ not quite a week ago; £20. 15/ is equal to 6·57c., gold, on the wharf here. It seems that the export duty in Spain is to be enhanced, to date from 1st proximo, and that the Spanish mines have therefore shipped out of the country unusually large quantities in May and this month, in order to evade the extra duty thereon; hence the momentary glut at London, Marseilles and other points. After a while the European markets will, in all likelihood, recover to where they stood after the declaration of war. Manufactures of Lead are in tolerably steady request; Bar at 7¼c., Pipe at 9c., and Sheet at 9½c., less the usual discount.

Spelter and Zinc.—Some small lots of ordinary Western brands of Spelter sold at New York at 5⅝c., currency, while the more desirable ones brought 6¼c. @ 6⅜c., currency. In the absence of available lots of foreign, nothing has transpired therein, and it can be only nominally quoted 6¼c. @ 6⅜c., gold. London accounts are to hand to the 1st instant, when the demand was the reverse of active, while the supply remained as free as ever, with the general tendency of prices still a downward one. *Sheet Zinc.*—The market is still devoid of animation at 8c. @ 8¼c., gold, Mosselman, and 7⅝c. @ 7¾c., currency, Domestic.

Nickel.—Consumers seem to be well stocked for the moment, and the market is dull at $1·85 @ $2, gold, per pound.

Antimony.—London remains firm at $49; some sales of desirable London brands have been made here during the week at 11¾c., gold.

EXPORTS

Of Hardware, Iron, Machinery, Metals, &c., from the Port of New York, for the Week ending June 12, 1877:

	Quan.	Value.
Hamburg.		
Clocks, cs	71	$1,176
Sew. mach, cs	250	3,705
Wringers, cs	4	170
Gas fix., pkgs	1	173
Ag. imp., pkgs	43	3,707
Machinery, cs	21	2,471
Hdw., pkgs	140	4,640
Mf. iron, cs	9	130
Bremen.		
Car'ge mtl, pgs	27	499
W'dmille, cs	58	1,800
Hdw., pkgs	23	706
Steel, bdls	8	126
Ag. imp., pkgs	282	7,341
Clocks, bxs	5	75
Pumps, cs	8	500
Rotterdam.		
Pumps, cks	3	300
Mf. iron, pkgs	6	153
Sew. mach., cs	4	284
Ag. imp., pkgs	9	550
Hardware, cs	14	311
Liverpool.		
L'mp g'ds, pgs	49	2,913
Pl'd g'ds, cs	11	1,172
Met. goods, cs	3	359
Guns, cs	4	1,500
Mach'y, pkgs	85	5,584
Tinw're, pkgs	2	100
Shoe nails cs	8	180
Hdw., cs	125	4,548
Car mtls., pkgs	7	1,050
Ag. imp., pkgs	33	766
Clocks, cs	596	9,476
London.		
Sew. mach., cs	168	5,130
Mf. cop., pkgs	20	700
Machinery, cs	2	180
Scales	30	375
Hardware, cs	81	2,436
Burners, cs	3	140
Ag. imp., pkgs	80	2,450
Pumps, pkgs	16	644
Clocks, bxs	228	5,203
Mf. iron, pkgs	2	128
Bristol.		
Clocks, bxs	142	1,664
Hdw., pkgs	17	120
Canada.		
Iron, bdls	30	600
Glasgow.		
Ag. imp., pkgs	3	327
Clocks, bxs	105	1,254
Hardware, cs	4	141
British North American Colonies.		
Hdw., pkgs	8	301
Iron, pkgs	2	100
Ventil'r'scrts	3	100
British West Indies.		
Hdw., pkgs	16	413
Car'ge mtl, pgs	11	66
British Guiana.		
Hdw., cs	5	95
British Australia.		
Car'ge mt., pgs	385	8,316
Mf. iron, pkgs	74	1,250
Ag. imp., pkgs	412	21,425
S'ndpap'r., rms	32	130
Lamps, cs	11	155
Wire, bxs	332	4,9·0
Sew. mach., cs	232	5,375
Pumps	33	$1,517
Wringers, cs	15	437
Mach'y, pkgs	13	1,665
Clocks, cs	139	2,041
Hdw., pkgs	627	14,523
Havre.		
Copper, cks	135	33,750
Ag. imp., pkgs	48	5,213
Mf. iron, pkgs	7	230
French West Indies.		
Car'ge mt., pgs	5	151
Cuba.		
Clocks, pkgs	12	147
Hdw., pkgs	101	1,146
Tinware, cs	13	345
Mach'y, pkgs	5	460
Mf. iron, pkgs	11	351
Nails, kegs	80	180
Ag. imp., pkgs	13	294
Lamp g'ds, pgs	22	575
Genoa.		
Sew. mach., cs	40	1,490
Clocks, bxs	2	20
Hayti.		
Lampw're, pgs	2	48
Iron safe	1	250
Mach'y, pkg	1	64
Hdw., cs	16	286
Mexico.		
Pumps, pkgs	19	1,105
Nails, kegs	341	946
Machinery, cs	13	660
Grindst's., cs	21	119
Mf. iron, pkgs	57	470
Nails, cs	56	1,174
Ag. imp., pkgs	68	2,239
Sew. mach., cs	159	3,125
Lamp g'ds, pgs	18	794
Tacks, cs	11	457
Blower	1	120
Cutlery, cs	5	258
Cartridges, cs	5	310
Hdw., pkgs	68	1,796
Arms, case	1	450
Venezuela.		
Clocks, bxs	28	555
Sew. mach., cs	34	1,274
Hdw., pkgs	66	1,424
Cutlery, cs	21	295
Brazil.		
Nails, kegs	100	275
Mach'y, pkgs	11	573
Tacks, bxs	16	166
Fire engines	3	5,350
Argentine Republic.		
L'mpw're, pgs	23	894
Hardware, cs	17	570
Ag. imp., pkgs	9	245
Mf. iron, pkgs	201	2,139
China.		
Hdw., pkgs	51	1,295
Clocks, cs	59	1,259
Coal, tons	93	329
Pumps, cs	4	700
Japan.		
Clocks, bxs	310	2,198
Hardware, cs	14	724
Mf. iron, pkgs	9	128
Coal, tons	50	189
Engines, cs	3	427
Nails, kegs	350	1,505
Scales, cs	10	198

IMPORTS

Of Hardware, Iron, Steel and Metals into the Port of New York, for the Week ending June 12, 1877:

Hardware.

Boker Hermann & Co.
Ironware, cs., 2
Booch & Koch,
Cutlery, cs., 3
Blumenthal J. & A.
Ironware, cs., 10
Carey Samuel,
Grindstones, cks., 25
Degraw, Aymar & Co.
Chains, cks., 2.
Chains, lengths, 3
Friedmann & Lauterjung
Mds., pkgs., 4
Greef & Nevins,
Ironware, cs., 2
Hammacher A. & Co.
Ironware, cs., 10
Laughland & Co.
Wire, bdls., 63
Wire, cks., 4
Wire, rolls, 37
Livingstone W. & F.
Grindstones, 2
Grindstones, cks., 48
Merchants' Dispatch Co.
Per. caps, cs., 2
Wadding, cs., 2
McCoy & Co.
Mdse., pkgs., 16
Mason J. W. & Co.
Wire rope, coils, 5
Remington E. & Sons,
Gun barrels, cs., 9
Schuyler, Hartley & Graham,
Arms, cs., 12
Empty c'tridge cases, cs., 14
Van Cleff & Co.
Ironware, cs., 4
Wiebusch & Hilger Hdw. Co.,
Mds., pkgs., 4
Ironware, cks., 18
Woodford W. O.
Grindstones, 6
Waefelar & Duysters,
Nails, cks., 65
Order,
Casks, 2
Cases, 3
[illegible]
Chains, cks., 2

Iron.

Henderson Bros.
Pig, tons, 200
Hopkins E. T.
Spiegel, tons, 302⅛
Marvel W. D.
Ore, tons, 250
Naylor & Co.
Bars, 2397
Bundles, 60
Phelps, Dodge & Co.
Sheet, bundles, 238
Plock & Co.
Plates, pkgs., 24
Whitney A. R. & Bro.
Flues, 100
Order,
Pig, tons, 300
Bars, 2238
Bundles, 12

Steel.

Brown William,
Cases, 1
Bundles, 109
Naylor & Co.
Scrap spring, kilos, 20,500
Prosser Thomas & Son,
Packages, 15
Sulzbacher, Hyman & Wolfe,
Bars, cs., 3
Bars, bdls., 42
Bars, 14
Wire drawing plates, cks., 1
Woodford W. O.
Cases, 23
Bundles, 40

Metals.

Ashley Morris,
Zinc, cks., 20
Agostini Joseph,
Scrap Metals, pkgs., 8
Bruce & Cook,
Tin plates, bxs., 1085
Burnham H. B. & Co.
Tin plates, bxs., 20
Byrne Jos. & Co.
Tin plates, bxs., 850
Douglass Jas. & Co.
Scrap brass and copper, bxs., 1
Hopkins E. T.
Tin plates, bxs., 747
Heroy, Marrener & Ward,
Sheet tin, cs., 4
Leaycraft Jeremiah,
Scrap metal, pkgs., 2
Merchants Dispatch Co.
Lead, pigs, [illegible]
Merchants' Bank of Canada.
Tin plates, bxs., 3427
Naylor & Co.
Tin plates, bxs., 2458
Phelps, Dodge & Co.
Tin plates, bxs., 1531
White L. D.
Tin plates, bxs., 70
Order,
Tin plates, bxs., 17,318
Lead, pigs, 810
Tin and terne plates, bxs., 2234
Lead, bars, 855

COAL.

A good deal of comment was caused and a considerable amount of uneasiness excited a few days since, by the announcement of the Pennsylvania Coal Company that they would sell during the present week 200,000 tons of Coal at auction. A pretty heavy decline was anticipated by many, and not a few persons thought that this would knock the bottom out of the market. The sale took place yesterday, as was advertised, and to the surprise of everyone the prices did not fall below those of the Scranton sale for May. This surprise was rea-

sonable in the face of the fact that a great many people supposed that the policy of the Pennsylvania Company was to break down the price of Coal in order to thwart Mr. Gowen's policy of obtaining a profit by carrying a large tonnage. The fact seems to be that the company wished to sell the Coal, and were willing to trust the public to make the price. Mr. Hoyt seems to think—and very justly, too—that in the long run this will net the company just as much as though the Coal had been sold across the counter.

We are indebted to Mr. Saward for the following figures relating to the sale. Two hundred thousand tons were sold, to be delivered at Newburg before the 1st of August:

		Sold at.	Average.
200 tons	Lump	$2·65	
5000	"	2 57½	$2·53
22,750	"	2·50	
3,000 tons	Steamer	2·53½	
2,500	"	2·50	2·48¼
3,700	"	2·42½	
250 tons	Grate	2·65	
8,500	"	2·55	
2,500	"	2·52½	2·54
23,700	"	2·50	
1,000	"	2·45	
250 tons	Egg	2·65	
24,000	"	2·50	2·51
1,000 tons	Stove	2·57½	
23,000	"	2·55	
6,100	"	2·52½	2·53¼
33,750	"	2·50	
5,000	"	2·45	
400 tons	Chestnut	2·55	
700	"	2·52½	2·45
2,600	"	2·50	
16,300	"	2·42½	
5,000 tons	Pea	2·05	

For the purpose of comparison and reference, we give herewith the average prices obtained at the May sales:

Size.	Pittston.	Scranton.
Lump	$2·75	.....
Steamer	2·75	$2·48
Grate	2·60	2·38½
Egg	2·80	2·51
Stove	2·77½	2·70¼
Chestnut	2·70¾	2·37

Quotations, of course, are merely nominal and are little guide to the buyer. During the week we have heard of sales of first-class Coal at prices very far below quotations.

OLD METALS, PAPER STOCK, &c.

There are still no signs of improvement in the Old Metal market. Consumers are diffident about purchasing, and only present wants are considered. Rags, Paper Stock, &c., have also been very dull, and prices have a downward tendency. White Rags, No. 1, are selling at 5¼c. a pound, on 60 days' time. We quote the following as the current purchasing rates:

Old Metals.—Copper, 14c. @ 15c. per lb.; Yellow Metal, 10c.; Brass, 8½c.; Composition, heavy, 12c.; Lead, solid, 4½c.; Tea Lead, 4c.; Zinc, 3½c.; Pewter, No. 1, 13c.; do., No. 2, 8c.; Spelter, 5¼c., Wrought Iron, $18 per ton; Light do., $10 per ton; Stove Plate, $9 per ton; Machinery, do., $12 per ton; Burnt Iron, $4 per ton.

Rags, &c.—Canvas, Linen, 4¾c. @ 5¼c.; do. Cotton, No 1, 5½c.; No. 2, 2¼c.; White, No. 1, 4¾c.; No. 2, 3¼c.; Colored, do., 2c.; Mixed, Woolen, 2c. @ 3c.; Soft, do., 5½c. @ 6c.; Gunny Bagging, 1¾c.; Jute Butts, 1¾c. @ 2c.; Kentucky Bagging, 3c.; Book Stock, 2¼c.; Newspaper Stock, 2c.; Waste Paper and Scraps, 1¾c.; Kentucky Bale Rope, 4c.; Oakum Junk, No. 1, 4½ @ 5c.; do. No. 2, 3c.; Tarred Shaking, 1c. @ 1½c.; Grass Rope, 3c. @ 3½c.

PHILADELPHIA.

Office of *The Iron Age*, 220 South Fourth St., PHILADELPHIA, June 13, 1877.

Pig Iron—The most prominent feature of the market during the week has been dullness and stagnation, and so far as can be seen at present there is nothing to warrant the expectation of an early improvement. Buyers are unusually apathetic, and with no prospect of an improvement in the demand for their products, they are extremely careless about purchasing the raw material. The demand from the stove trade is specially disappointing, while that from the mills shows no signs of improvement, and, in fact, as we remarked last week, the only inquiries of importance seem to come from the bridge builders, who are all well supplied with orders. Under these circumstances it is not surprising that prices are weak, and quotations can be realized only by meeting the demand for such lots as may be required. There does not appear to be quite so much pressure to sell, not that producers are less anxious, but owing to the fact that business cannot be forced unless at a serious sacrifice in prices, which is almost immediately met by similar reductions by others. Having learned this by experience, the trade seems quieter, and although prices are weak, they are probably more uniform than they have been for some time past, although four months without interest or probably fifty cents per ton rebate for prompt cash, for round lots, would be allowed by the majority of sellers. We quote $17, $18 and $19 for Forge No. 2 and No. 1 Foundry, with special brands at about $1 per ton more money. We understand the Saucon Iron Company have just blown in one of their furnaces at Hellertown, and the Allentown Rolling Mill Company have blown out one of theirs.

Blooms.—The demand is fair, but in some instances we hear of a little shading in prices, although the following quotations fairly represent the market: Sunken Scrap Blooms (2464 lbs.), $42 to $45; Northern Ore Blooms (2240 lbs.), $38 to $42; best quality Charcoal Billets (2240), for wire and steel purposes, $52·50 to $55; Bars, ditto, $65 to $67·50; Sheet Iron Blooms, cornered (2464 lbs.), $65 to $67; Cold-blast Charcoal Plate Blooms, $57·50 to $60; run out Anthracite, $50 to $52·50.

Manufactured Iron.—The general trade continues very much depressed, but in consequence of two or three important contracts having been closed within the past day or two, the outlook is again rather more encouraging. The first (details of which appears in another column) is that by A. & P. Roberts & Co. for Bridge Iron, amounting to 3600 tons; the second is the contract for 850 tons Iron Beams for the new Philadelphia Post Office, by Messrs. Stewart & Stephens, and the third is a contract for three new steamships, each of about 1100 tons, for the Alaska and San Francisco trade, to be built by John Roach & Son. These contracts come in very opportunely, and will no doubt impart a little more life to things, and prevent business from relapsing into complete lethargy, as seemed imminent a few days ago. *Per contra.*—The Iron Pipe trade, after several days' session and a careful review of the trade, "resolved to largely curtail production," but to what extent, at what time, and by whom the curtailment is to be made appears to be an open question.

Bars.—The dullness noted in our last still continues, and prices, in consequence, are very weak. Some of our mills are already shutting down for stock taking, repairs, &c., but there is no prospect of any inconvenience on that account. The reports from the interior are somewhat better, and we are informed that the demand for special sizes from the makers of agricultural implements, iron fences, &c., is very satisfactory. There is also a fair demand from the bolt manufacturers. In other directions business is unusually dull, and likely to remain so for some weeks to come. The demand is still largely for low priced Iron, although it is beginning to be understood that quality is made just in proportion to the price obtained. It is much to be regretted that these low qualities of Iron are being so largely used, as eventually the result will be unsatisfactory to all parties concerned. We quote the market dull at 1·70c. to 1·85c. for Common, and 2c. to 2·10c. for Best Refined.

Plate and Tank Iron.—The demand has been somewhat better the past few days, and with more inquiries the market wears a more cheerful aspect. We do not hear of any large contracts being made, but there is a steady demand for small lots, which gives a fair business in the aggregate. The demand is more especially for oil tanks, &c., although there is also a renewed demand for ship and bridge building purposes, with fair prospects of its continuance throughout the summer. We quote Ship Plate at 2¾c.; Tank Iron, 2¾c. to 2¾c.; Shell Iron, 3c.; Flange Iron, 4c. to 4½c.; and Best Bloom, 6c. to 6½c.

Sheet Iron.—There is a slightly improved demand for Sheet Iron, although not nearly sufficient to absorb the output. Prices are cut very fine, and to secure any business at all profits are said to be out of the question. One or two of the mills have orders ahead for all they can turn out, while others are still piling up stock. The feeling in the trade is very despondent, and at present there appears to be no encouragement in the future. We quote Common American, No. 6 to 17, 2¾c. to 3c.; No. 18 to 28, 3¼c. to 3½c.; Best Charcoal Bloom, No. 6 to 20, 5¼c.; No. 22 to 28, 5¾c. to 6c.; Philadelphia Russia, 8c.

Skelp Iron.—We do not hear of any recent sales, but it is understood there are buyers in the market for 1000 to 2000 tons. It is believed, however, that some of the country mills are willing to shade city prices, and it is probable the orders will be placed at outside points. We quote 2·15c. to 2·50c.

Muck Bars—Prices may be considered nominal at $34 to $36·50, Philadelphia delivery. No sales of any importance for some time past.

Steel Rails.—There is nothing doing of any importance, and the market may be considered quiet and steady at late quotations. Higher prices are realized in some exceptional instances, but on a cash basis prices are barely steady. We hear of one sale of 5000 tons, part cash, and balance in Old Rails, prices not stated, but understood to be equal to outside rates. A few small lots have changed hands at $47 to $47·50, cash, at mills, and Street Rails at about $55. There is no doubt a cash buyer for a large lot could easily place his order at inside rates, but as no buyers of large lots are in the market at present, prices may be considered almost nominal. We quote $46 to $48, cash, at mills. Market quiet.

Iron Rails.—There is nothing special to report, although there are still plenty of inquiries, with a reasonable prospect of business after awhile. Buyers can be found in plenty, but there is not much improvement in the financial position, hence negotiations are a long time pending before being brought to a conclusion. There are inquiries for several thousand tons from Western roads, and several Southern roads are also seeking to place their orders. It is not likely the former will purchase in this vicinity, but the Southern roads will probably succeed in placing their orders in course of a few days. A few sales of small lots are reported at $37 to $39, Philadelphia delivery, but $33 to $36, cash, at mills, according to quality, may be considered an average rate for round lots.

Old Rails.—The market is unusually dull, and it would be impossible to place any large lots, even at inside figures. A few 100 ton lots of extra quality have been placed at $21 to $21·50, and one 400 ton lot at $21, but unless for strictly extra quality there is no immediate demand. We quote $19·50 to $21, according to quality. Market very dull.

Scrap Iron.—The market is decidedly weak, and sales are mostly at inside figures, although extra quality may bring full rates. We quote Cast, $15 to $16·50, and Wrought, $22·50 to $24·50.

Car Wheels are nominal at $18·50 to $20, according to make. No sales since our last report.

Nails.—The nominal quotation is still $2·60, but we are informed that $2·50 more nearly represents the actual market, with exceptional sales at lower prices.

Tin Plates.—The demand is steady and prices without change. I. C., 10x14, Best Charcoal Bright, $7·50 to $8; I. X., 10x14, $9·75 to $10·25; Best Charcoal Leaded, 28x20, $14 to $14·50; good Charcoal Leaded, $13·50 to $13·75; other good brands, $12·50 to $13·25; good Bright Tin for Cans, &c., $6·50 to $7·25; Coke Leaded, 14x20, $6 to $6·50.

Lead.—There is nothing new to note in the Lead market. Trade in this metal is very sluggish indeed. Foreign pig is quoted nominally at 6⅝c. to 6¾c., gold. The English market is a shade easier. There has been very little done in Domestic since our report last week. Some small lots of common have been disposed of at 5½c., currency. Fine quoted nominally at 5¾c. to 6c., currency. Manufactured is steady at the old prices, viz.: Pipe, 9c.; Sheet, 9½c., and Bar, 7¾c., less the trade discount of 10 per cent.

Shot.—Drop Shot, 25 lb. bags, 9¼c.; do., 5 lb. bags, 10¼c.; Buckshot, 25 lb. bags, 10¼c.; do., 5 lb. bags, 11¼c.; Conical Balls, 25 lb. bags, 10c. per lb., net; Bar Lead, 5 oz., ½ lb. and 1 lb. Bars, 7¾c., less 10 per cent. to the trade.

Old Metals.—Market steady at following quotations: Heavy Old Copper, 17c.; Light Tinned Copper, 15½c.; Copper Bottoms, 15c.; Heavy Red Brass, 13c.; Heavy Yellow Brass, 10c.; Heavy Clean Pipe Lead, 5c.; Junk Lead, 5¼c.; Tea Lead, Light Paper, 5½c.; Tea Lead, Heavy Paper, 5c.; New Zinc Clippings, 4½c.; Old Sheet Zinc, 4c.; Yellow Brass Turnings, 9c; Plumbers' Lead Joints, 6c.

PITTSBURGH.

Office of *The Iron Age*, 77 Fourth Avenue, PITTSBURGH, June 12, 1877.

Pig Iron—Continues very dull, and there is no prospect of any immediate improvement. The consumption has fallen off largely within the past few weeks, for while the mills generally are still running, a large percentage of the puddling furnaces have been shut down; hence but little Pig is wanted. The mills are all determined, for the time being, not to buy a pound more than is absolutely necessary to supply immediate actual wants; and trade is likely to continue dull for some time to come. The tone of the market is weak, owing to the very light demand, yet prices have undergone no change recently, and standard brands of Mill, in consequence of the very meager supply, are held with considerable firmness. Sales of Bituminous Coal Smelted at $23·50 to $24, 4 months for No. 1 Foundry; $22·50 to $23 for No. 2, and $21 to $21·50 for Gray Forge. Anthracite—$22·50 for No. 1 Foundry, and $18 to $20 for Gray Forge; Red Short (Cornwall Ore), $22 to $22·50.

Manufactured Iron.—The situation remains substantially the same as noted in last report. Business continues very dull. Some mills have shut down, and but very few if any are working more than single turn, and moreover prices are, as they have been all the year, very unsatisfactory. The base price is generally quoted at 1·70c. to 1·75c., but sales are reported as low as 1·65c. and even 1 60c., which, it is claimed, does not more than cover cost of the raw iron and puddling. It is hoped and expected that business will improve next month, as stocks in hands both of jobbers and consumers are light, and as hard pan has certainly been reached buyers need not be afraid to take hold.

Nails.—Nothing particularly new to report. Business continues dull, but not any more than usual at this season of the year. Prices here are being rigidly adhered to, $2·60, 60 days, for less than 200 kegs, and $2·50, 60 days, for 200 kegs and upward. It is said that some of the Eastern mills are offering to sell at very low figures in Chicago and at other points in the West.

Horse and Muleshoes—Continue quiet and unchanged. Shoenberger & Co. quote the former at $3·80 and the latter at $4·80. An improved trade next month is not improbable.

Wrought Pipe.—The mills hereabout, five in number, are all in operation, and while business is improving it is not what it should be at this season of the year. The meeting of manufacturers in Philadelphia last week failed to accomplish anything, although a movement to run the mills only half-time came within one vote of being made unanimous. The association has control of some 12 or 15 pipe mills, having leased them, and they are all standing idle. The object of the association is to keep down production, and it is the best thing that can be done under existing circumstances. If all the capacity of the country were engaged, the production would be so much in excess of the consumption that prices would be down below actual cost, and then there would be no regularity.

Steel.—Nothing new to report excepting that business is falling off, as it usually does at this season of the year. No recent change in prices. The meeting of Steel spring and axle manufacturers in this city last week, arrived at an agreement of some kind or other, but what it was has not yet been made known to the outside public.

Glass.—The window glass trade continues dull, although possibly not much more so than usual at this particular time. The factories are all in operation and will continue so until the 1st, perhaps the middle, of July. No change in discounts. Fruit jar manufacturers are quite busy, and will be for a couple of months to come.

White Lead.—There is a fair trade, but no change in prices. The regular quarterly meeting of the Western Association will meet in this city to-morrow.

Petroleum.—Prices are lower as compared with this day, owing to the increased production of the raw article. Several new wells reported, one of which is said to be producing from 800 to 900 bbls. per day. It is rumored that the "Prentice Combination" has been gobbled up by the "Standard," and so the latter will no doubt get after the Potts faction with a sharp stick.

The Puddlers and Manufacturers.—There has been no change in the situation since the date of our last report. Some of the mills have renewed the old compact, while others have done nothing as yet in regard to the matter, and the indications are that there will be no concert of action on the part of the manufacturers, but that each firm will be free to do as they please. The mills are nearly all pretty well supplied with Muck Bar, and there is not likely to be much puddling done during the next five or six weeks.

Coal.—Between 5,000,000 and 6,000,000 bushels of Coal were shipped away from here by river last week, mostly to Cincinnati and Louisville.

Coke.—Is rather dull, but prices remain unchanged—$2·25 to $2·50 per ton, delivered free on cars in Pittsburgh.

CLEVELAND.

CLEVELAND, June 12, 1877.

Iron Ores.—There have been but few sales of Lake Superior Ores during the past fortnight, the furnaces generally not daring to undertake contracts for Ore with the outlook for Pig Iron as discouraging as at present. There is considerable interest felt in the new Iron producing regions of the Shawnee Valley, and many of the manufacturers of Pig Iron in this vicinity are transferring their attentions to the Shawnee. It is estimated that a dozen furnaces will be active in that district within the next six months. That being the case, Iron produced at a cost of $12 to $14 must become a damaging competitor to furnaces using the more expensive Ores of Lake Superior. For standard Ores, of which there are now only a limited quantity to be had, we have heard of no concessions being offered or made.

Pig Iron.—The demand for Charcoal Iron of select grades only continues to be good, but prices are no better, owing to the sharp competition. The production of Charcoal Pig is considerably curtailed, but is still in excess of the demand, and the long carried stocks are not diminishing. There is not a good demand for standard Foundry Irons from Lake Superior ores at a remunerative price, metal made from cheap ores seeming to supply the wants of founders about as well as the good Irons. The supply of Blackband Irons continues to fall below the demand for immediate delivery, but there is no advance in price, which ranges on all kinds of Foundry from $21 to $24, according to circumstances. The demand for Mill Iron is limited, the mills generally supplying themselves with Scrap.

Bar Iron and Nails.—The trade in Bars and Nails has fallen off, and the mills are not so pressed with orders. There is a movement quietly on foot looking to a reduction in the price of puddling, but it has not yet assumed any definite shape.

Old Rails.—The trade in Old Rails and all kinds of Scrap Iron is good, and prices for Rail Scrap are firm at $20 to $21, cash and time.

BOSTON.

JUNE 9.—*Pig* continues depressed, and prices tend downward. The talk of shutting down the production of certain kinds of manufactured Iron is not encouraging to holders of Pig. We quote $22·50 to $23·50 for No. 1; $21·50 to $22 for No. 2, and $21 to $22 for Gray Forge. *Bar* is dull, quoting $46 to $47 for Refined, and $37 to $38 for Common. Nails are in light demand at unchanged prices. Sheet is selling at 3c. to 3¼c. per pound. Russia is quiet at 12c., currency. It is believed that the Pipe manufacturers will shut down for three months. *Copper* is steady and unchanged at 19c. to 19¼c. for ingot. The outside price is asked for futures. Supplies are increasing, and the market rather tends downward. For manufactured we quote: New Sheathing, 30c. to 31c.; Bolts and Braziers, 31c. to 31½c.; Yellow Metal Bolts, 25c. to 25½c.; ditto Sheathing, 20c. to 20½c. *Lead* is easy, with a small demand. We quote: Pig, 5¾c. to 6c., currency, for Domestic; Sheet, 9½c.; Pipe, 9c.; Tin Lined Pipe, 16½c.; Bar Lead, 8¾c. to 9c., less usual trade or 10 per cent. discount. *Antimony* is firm at 12c. to 12½c., gold, for Boston spot lots, and *Spelter* is easy, closing at $6·25 on the spot for 10 ton lots. *Tin* is firm, and prices rather tend downward. We quote: Straits, 16¾c. to 17c.; Banca, 19¼c. to 19¾c.; Refined English, 16½c. to 17c., gold. We quote Plates: Charcoal I. C., $7 to $7·50; Coke, $6·10 to $6·25; and Terne at $6·75 to $7·25, gold.—*Commercial Bulletin.*

CHATTANOOGA.

Specially reported by S. B. LOWE, dealer in Metals, under date of June 11: Iron has been quite active the past week, and the following sales are noted: 100 tons Chattanooga G. F., $17, 4 mos.; 100 tons R. F. G. F., $16·50, 4 mos.; 300 tons Old Rails, $16·50, cash; 100 tons Old Rails, private terms; 50 tons old Wheels, $18·50, 4 mos.; 100 tons Cherokee W. and M., $19, 4 mos., and about 100 tons in car load lots to foundries South. Prices range about as follows:

COKE.

No. 1 Foundry, extra	$21·00 @ 21·50
No. 1 Foundry	19·50 @ 20·00
No. 2 Foundry	17·50 @ 18·00
Gray Forge	16·00 @ 16·50
White and Mottled	15·00 @ 15·50

HOT-BLAST CHARCOAL.

No. 1 Foundry, extra	$21·50 @ 22·50
No. 1 Foundry	19·50 @ 20·50
No. 2 Foundry	18·00 @ 19·00
Gray Forge	16·50 @ —
White and Mottled	16·00 @ —

COLD-BLAST CHARCOAL.

Car Wheel Metal	$22·50 @ 27·50
" " extra standard	24·50 @ 34·50
Forge Metal	17·50 @ 20·50
Muck Bar	30·50 @ 34·50
Old Car Wheels	17·00 @ —
Old Rails	16·00 @ 17·00
Brown Hematite Ore, 50 to 56 per cent.	$1·75 @ 2·25
per ton	50 to 56 per
Red Fossiliferous Ore,	1·50 @ 1·75
cent. per ton	

CINCINNATI.

Messrs. L. R. HULL & Co., under date of June 11, write us as follows: PIG IRON.—The market is generally quiet, with a fair demand. We do not anticipate any improvement before fall, when it is generally anticipated trade will undergo considerable improvement, in consequence of the good crops which are now anticipated. The prices below are reversed somewhat to cover the actual range of the market.

HOT-BLAST FOUNDRY.

Hanging Rock	No. 1, Charcoal	$24·00 @ 24·50—4 mos.
Hanging Rock	No. 2, Charcoal	22·50 @ —1 mos.
"	No. 1, Coke	24·00 @ 24·50—4 mos.
"	No. 2, "	22·00 @ 22·50—4 mos.
"	No. 1, Stonecoal	21·00 @ 22·00—4 mos.
Virginia	No. 1, Coke	24·00 @ 24·50—4 mos.
"	No. 2, "	22·50 @ 23·00—4 mos.
Ala. and Tenn.	No. 1, Charc'l	23·00 @ —4 mos.
" "	No. 2, "	21·50 @ 22·50—4 mos.
Fannie U. S. Scotch	No. 1	23·00 @ —4 mos.
Alice "	No. 1	24·50 @ —4 mos.
Am. Scotch	No. 1	21·00 @ 22·00—4 mos.

FORGE IRONS.

Hanging Rock	No. 1, Charcoal	$21·00 @ —4 mos.
Hanging Rock	No. 1, Coke	21·00 @ —4 mos.
Virginia	No. 1	20·00 @ 21·50—4 mos.
Ala. and Tenn.	No. 1, Charc'l	20·00 @ 21·50—4 mos.
Red-short	No. 1, Coke	22·50 @ 23·00—4 mos.
Cold-short	No. 1, Stonecoal	19·00 @ 20·00—4 mos.

CAR WHEEL AND MALLEABLE.

Hanging Rock		$40·00 @ —4 mos.
Southern and Western Brands		30·00 @ 35·00—4 mos.

ORE.

Lake Superior		$8·50 @ —cash.
Virginia Hematite (Washed)		4·25 @ —cash.

LOUISVILLE.

Messrs. GEO. H. HULL & Co., under date of June 11, write us as follows: The market is dull and lower. Consumers are disinclined to believe that there will be an advance in prices in the near future and buy for immediate wants only. The usual time, 4 months, is allowed on the quotations below:

FOUNDRY IRONS.

No. 1 Hanging Rock, Charcoal	$24·00 @ 24·50
No. 2 " "	21·00 @ 22·00
No. 1 Southern, Charcoal	21·00 @ 22·00
No. 2 " "	20·00 @ 20·50
No. 1 Hanging Rock, Stonecoal and Coke	22·00 @ 23·00
No. 2 Hanging Rock, Stonecoal and Coke	20·00 @ 21·00
No. 1 Southern, Stonecoal and Coke	20·50 @ 21·00
No. 2 " " "	20·00 @ 20·50
"American Scotch"	22·50 @ 23·00
Silver Gray	19·00 @ 21·00

MILL IRONS.

No. 1 Charcoal, Cold-short and Neut'l	20·00 @ 20·50
No. 1 Stonecoal and Coke, Cold-short and Neutral	19·00 @ 20·00
No. 2 Stonecoal and Coke, Cold-short and Neutral	18·50 @ 19·00
No. 1 Missouri and Indiana Red-short	22·00 @ 23·00
White and Mottled, Cold-short and Neutral	16·00 @ 17·00

CAR WHEEL AND MALLEABLE IRONS.

Hanging Rock, Cold-blast	35·00 @ 38·00
Alabama and Georgia, Cold-blast	26·00 @ 33·00
Kentucky, Cold-blast	25·00 @ 36·00

ST. LOUIS.

Specially reported by Messrs. SPOONER & COLLINS, Iron commission merchants, 217 North Third street, St. Louis, under date of June 7: Our market continues very dull and quiet. The demand seems to have fallen off since last report, though prices remain the same. We quote as before:

	No. 1.	No. 2.	Mill.	White and Mot'l'd
Missouri Stone Coal	$25·00	$23·00	$22·00	$21·00
Missouri Charcoal	23·00	22·50	22·00	20·00
Tennessee Charcoal	23·00	22·50	22·00	20·00
Tenn. Coke, very soft and strong	25·00	23·00	22·00	22·00
Hanging Rock Charcoal	26·00	24·50	23·50	....
H. R. Charcoal, Cold-short	25·00	24·00	....	....
	Extra No. 1.	No. 1.	B. No. 1.	No. 2.
Alice H. R. Coke	25·50	25·00	24·50	23·00
Quinnimont, West Virginia, Coke	25·00	24·00	23·50	22·50

COLD BLAST CHARCOAL—All Numbers.

Hanging Rock	$25·00 @ 40 00—4 mos.
Tennessee	28·00 @ 30·00—4 mos.
Kentucky	28·00 @ 30·00—4 mos.
Missouri	28·00 @ 30·00—4 mos.
Georgia	28·00 @ 30·00—4 mos.
Alabama	28·00 @ 30·00—4 mos.
Assorted Bar Iron	@ 2 1-10 rates.
No. 1 Wrought Scrap	·90 @
No. 1 Railroad	1·00 @
Machinery Cast "	·80 @
Light Cast "	·55 @
Old Rails	19·50 @ 20·00—4 mos.
Old Car Wheels	18·00 @ 19·00—4 mos.

BALTIMORE.

Messrs. WYETH & BROTHER, Iron and Steel merchants, 46 and 48 South Charles street, report us the following prices, under date of June 11: We have again to report a quiet market for the past week, with however improved inquiry, which has led to some business on a close basis. Quotations remain unchanged.

AMERICAN REFINED BAR IRON.

1 to 6 wide by ⅜ to 1 thick.. } 1 to 4½ wide by 1⅜ to 2 thick }	1·95 to 2c. ₩ lb
Round and square, ordinary sizes, from ⅜ to 2 inclusive	1·95 to 2c. "
Hoop Iron, 1½ wide and upward	3 to 3½c. "
Band Iron, from 1½ to 4 in. wide	2¾ to 3c. "
Horse Shoe Iron ⅜ to 1 wide by ⅜ to ⅝ thick	3¼ to 3½c. "
Norway Nail Rods	5¾ to 6c. "
Black Diamond Cast Steel, Flats, Squares and Octagon, ordinary sizes	14½ to 15c. "
Machinery Steel	8 to 9c. "
Cast Spring Steel	7½ to 8c. "
Homogeneous Steel Plate	8½ to 9c. "
Perkins' Horse Shoes, per keg of 100 lbs	$3·92½
" Mule Shoes " "	4·92½
R. R. Spikes	2¼ to 2½c.

Common Horse Nails, from 14c. to 18c. per pound.

	10	9	8	7	6	
Putnam Horse Nails	23	24	25	26	28c.	per ₩.
Globe Horse Nails	23	24	25	26	28c.	per ₩

Messrs. R. C. HOFFMAN & Co., Iron and commission merchants, No. 23 South Frederick street, report the Pig Iron market as follows, under date of June 11: Our Iron market continues dull and depressed, with but little prospect of speedy improvement. Sales are light at quotations.

Baltimore Charcoal	$29·00 @ 31·00
Virginia "	28·00 @ 32·00
Anthracite No. 1	20·00 @ 21·00
" No. 2	19·00 @ 20·00
" No. 3	18·00 @ 19·00
White and Mottled	16·00 @ 17·00

FOREIGN

FRANCE.

(Moniteur des Interets Materiels).

PARIS, May 27, 1877.—*Metals.*—The uneasy feeling to which we alluded in our last report is gradually disappearing, and merchants and manufacturers transact business with pretty much the same confidence which characterized their dealings a fortnight ago. *Copper* has become steadier; most people in the metal trade seem to have arrived at the conclusion that a further decline would inevitably stop production. Although the dealings here have been insignificant during the week, there has been a recovery in price. We quote, deliverable at Havre: Chili Bars, 187·50; Common ditto, 182·50; Ingots and Slabs, 192·50; English Best Selected, 195, and pure Corocoro Ore, 190. Havre, on the contrary, has been weak and downward, but in the absence of actual business quotations there are merely nominal. They quote first brands Chili Bars, 182·50 to 183·75 francs the 100 kilos; good, current Chili brands, 180 to 181·25, and Lota and Urmeneta, 177·50 to 178·75. At Marseilles the decline in Copper seems to have been arrested, but general opinion there does not seem to favor the idea of a great revival in the demand for it. Large lots of Egyptian demonetized Copper coin are continually dropping in from Alexandria; Old Copper has in consequence declined to 162 francs the 100 kilos, at which, we are told, a further sale has been effected to arrive. They quote Red Tokat, 180; Small Refined Ingots, 180 to 185; Sheathing, 225; Bolts, 235; and Yellow Metal Sheathing, 205. *Tin.*—We shall have to wait for the statistics of the 1st proximo and the May shipments from Australia and the Straits ere a correct judgment respecting the more immediate future of this metal can be found; meanwhile there is again a slight weakness at London, not unlikely the fore-

runner of a further decline, unless the London stock should prove little larger than May 1. The market here is well sustained; we quote Banca, deliverable at Havre or Paris, 197·50; Billiton 192·50; Straits, 190; Australian, 188·75; and English, at Havre or Rouen, 187·50. Very little transpires at Marseilles, where no change has occurred; they quote Banca, 195; Straits, 185; Billiton, 185; and English Refined, 192·50. *Lead.*—As we have had occasion to point out in former reports the French and general continental markets have been slow in at first following in the wake of the first English improvement, and now appear much less influenced by the sudden recoil at London than might have been supposed would be the case. The fact is, we repeat, that Spanish is scarce on the continent. We have risen 50 centimes here, and now quote the range of 54 to 54·50 francs the 100 kilos. Havre is now 54·50; Soft, at Marseilles, is quite firm, but there is not much doing; they quote First Fusion, 51 francs; Second ditto, 50; Sheet and Pipe, 57; and Shot, 55. *Spelter* is only sustained with difficulty here. We quote Silesian, deliverable at Havre, 53·25; other good brands, 52·25; and at Paris, 53·50. Havre remains steady at 54. Marseilles is lower; they quote Vieille Montagne, 70 francs; and Old Remelted, 48. *Iron.*—There is no lack of small orders; prices are tolerably well sustained, and those manufacturers whose pretensions are moderate have no cause for dissatisfaction. Hardware industry is getting on most actively; machinery in the Haute-Marne is also doing well, but Pig Iron is dull pretty much everywhere, and this, more than anything else, tends to hold in check a general revival. Altogether apart from the orders for Exhibition buildings, some of our works have received orders of some importance. Among others the Creusot received orders for a floating dock for Saigon, Cochin China, which will amount to 2,998,500 francs, and for 206,000 tons Rails for Russia. The Bussy Works received an order for hydraulic cranes and turning tables for the Eastern Railroad, while Messrs. De Quillacq & Co., of Anzin, will furnish three bridges for the Neufosse Canal. We quote, without change, first-class Merchant Iron at Paris, 190 francs, and 200 in the Lotre district. Pig Iron in the Muerthe et Moselle commands 63 to 64 francs. *Coal* has shown great irregularity in price. According to official statistics lately published, France in 1789 produced 250,000 tons of Coal; in 1815, 950,000; in 1830, 1,800,000; in 1843, 3,700,000; in 1855, 7,453,000; in 1869, 13,464,000; in 1872, 15,703,000; and in 1873, 17,486,000; consuming in 1789, 454,000; in 1815, 1,180,000; in 1830, 2,431,000; in 1843, 5,221,000; in 1855, 12,294,000; in 1869, 20,591,000; in 1872, 22,292,000; and in 1873, 23,829,000. In 1872 our import from Belgium, England and Germany was 7,313,000 tons; our export to Germany, Belgium, Italy, Switzerland, Spain, Turkey, Egypt and Algeria, 784,000. Our great future for export lies in the Mediterranean.

BELGIUM.

(Revue Universelle).

BRUSSELS, May 27, 1877.—*Iron.*—Accounts from the Iron districts of Belgium vary little from those lately reported by us. Iron manufacture for the moment receives its sole support from current consumption. The stores of manufacturers' agents and of dealers are empty, yet the latter care little to supply themselves at present, notwithstanding the inducement held out to them by current low prices. They prefer to postpone buying till they see unmistakable signs of a serious revival at hand, rather than block up their capital uselessly for an indefinite time. Pig Iron shares the stagnation of Merchant Iron, and despite its low price, it is difficult to move larger quantities at a time. Most of our makers are making efforts to introduce cheaper methods of manufacture; some reduce general expenses, others adopt perfected sets of machine tools, exercise a closer supervision or contrive to diminish labor by newly invented ingenious mechanical combinations. By dint of economy in a hundred shapes they are thus enabled to struggle on through adverse times. The Cockerill Society, of Seraing, has turned out at its steel works, during the week ending May 20, 1842 tons Steel in ingots, from which there were made 1580 tons finished Rails and 22 tons Rails to be re-rolled, together 1602 tons, the refuse being 14·05 per cent. The Rails weighed 38 kilos 3 centigrammes the meter, each Rail measuring 9 meters. The ingots were most of them carried hot from the Bessemer foundry to the great rolling mill, then exposed to blooming, and finally rolled through the great reversible train to the length of 19 to 20 meters, and then sawed to their proper length. This extraordinary result of 1602 tons has been obtained in 11 intervals of 12 hours each, or 145¼ tons to the interval. The maximum attained has been 158 tons to an interval of 10 hours and 7 minutes. The maximum hitherto reached had been obtained at the Pittsburgh Steel Works, 132 tons per interval, and a total of 1577 tons in 12 intervals.

GERMANY.

(Borsenhalle).

HAMBURG, May 26, 1877.—*Metals.*—The metal trade of Germany has now adapted itself to the new order of things brought about by the war in the East, and while in one direction it may be a slight sufferer by it, on the whole it may be safely asserted that our relations in the branch with Northern Russia are getting on smoothly. *Copper.*—This metal still lacks buoyancy, transactions are limited in extent, and prices irregular. Any improvement abroad seems to have no effect here. Berlin is quiet; they quote good qualities English and Australian 76 to 78·50 marks the 50 kilos, and Refined Mansfield, 77·50 to 78. English at Stettin is quoted 90 marks. No change here. *Tin* is ill sustained in the German market, nor do we see that anything can help the metal but a decidedly favorable change in the statistical position in England and Holland. The tendency at Berlin is downward; they quote Banca 76 to 76·50, and English 74 to 74·50 marks the 50 kilos. Stettin and our own market unaltered. *Lead.*—The German markets have displayed much firmness during the week; Berlin quotes, Tarnowitz Hartz, and Saxonian, 20·75 to 21 marks the 50 kilos. At Stettin a good deal of Lead has been bought for Russia; they quote Spanish, 26 to 26·50, and Germany, 24. *Spelter* seems to be more neglected in our markets than at any previous time during the year, and at a season when the contrary should be the case. Our own market is unaltered. Berlin is nominal at 20·25 to 20·75; Stettin, 21·50 to 22·50; Breslau, 19 marks the 50 kilos.

HOLLAND.

(Koch & Viterboom.)

ROTTERDAM, May 29, 1877.—*Tin.*—This metal has by degrees become weaker again, and is quiet now in expectation of to-morrow's auction sale. After having lingered at the figure of 44 guilders the 50 kilos during some time, Banca gradually dropped to 43¾, and some business has since transpired at 43. It is offered at the latter price deliverable from the impending sale without meeting with a purchaser, buyers preferring to await the result of the auction in hopes of doing better there or subsequently. Billiton, to be delivered in all the coming month has been done at 41¾, which is also a decline of a quarter during the week. Stock on warrants with the Netherland Trading Society, in first and second hands, 52,576 slabs Banca, and 7262 slabs Billiton, against 88,624 slabs Banca, and no Billiton a year ago. May deliveries, 6200 slabs Banca, against 4700 last year. Total deliveries since January 1, 1877: 53,889 slabs Banca, and 2010 Billiton, against 32,757 Banca, and 100 Billiton in 1876. Afloat by sail from Banca, 8975 piculs Banca, against 6000 a year ago. Billiton deliveries in May: 10,178 Slabs; since Jan. 1, 39,577 Slabs; stock, 23,027. *Lead.*—Stolberg declined to 12¾ guilders.

CHINA.

(Arnhold, Karberg & Co.)

CANTON, April 20, 1877.—*Metals.*—*Lead.*—There has been a fair speculative inquiry, and sales of distant shipments have been made at $7·30 per picul for L. B. On the spot $7·50 would to-day be obtainable. Sales of common, 500 pigs; of L. B., 1680 piculs. We quote the range, $7·40 to $7·52½. *Tin.*—Weaker again and difficult to move. Sales 800 slabs. We quote the same $18 to $21·60 per picul. *Quicksilver.*—A good business has been done, but previous rates have not been maintained; stocks are very large. Sales 2270 flasks. We quote English, $60·50 to $61, and California, $61·50 to $62 per picul.

EAST INDIES.

(Gilfillan, Wood & Co.)

SINGAPORE, April 26, 1877.—*Tin* has been very quiet, and value declined to $19·75 per picul, but has since rallied to $20 per picul. We have had a long course of dry weather, and this has materially checked the production; supplies are, therefore, moderate, and shipments for the month likely to be under the average. *Tonnage* is still in full supply, and we quote rates weak at 40/ per ton for deadweight. The Holina is just finished her loading for New York, leaving the Dewa Gangadhur to follow. For Boston the Chocoura is still loading. *Exchange* has advanced to 4/1⅛, and some business at 4/1⅛.

Our English Letter.

Review of the British Iron, Steel, Metal and Hardware Trades.

(From our Regular Correspondent.)

SHEFFIELD, Eng., May 28, 1877.

OUR WAR NEWS

is rather meager, but, in a condensed form, it would appear to indicate that up to the present juncture the contending forces are pretty well matched in the Asian campaign, and that Russia is making most formidabe and careful preparations before venturing across the "Blue Donan," on the opposite bank of which now flooded river the Turks have exerted every nerve and muscle in defensive entrenchments, forts and batteries. Diplomatically the situation seems rather farcical, and the Russians appear to be growing fond of making their "big" spurts, with that theatrical *elan* of which his late Majesty Napoleon the Third was so enamored. For instance, the Russian army did not advance until the Czar went down to Kischeneff, then he went to Moscow and issued a proclamation to his beloved subjects, and now he is "announced" for the banks of the Danube a few days hence. On the other side, too, there has been some beating of the showman's tom-tom, by conferring the new title of "The Conqueror" on the Sultan, but in this case it may mean something with the Eastern people who cannot hear "the rattling of the ropes." Austria and this country continue to observe a policy of "masterly inactivity," but are also getting together the various components which form so large a part of the tragedy of war, when once the spark is applied. According to a London weekly journal the Queen has given the royal assent to the dispatch of two *corps d' armee* (of 40,000 men of all arms) to the East immediately our interests are imperiled. Lieut.-General Spencer will command the force, which the paper mentioned details with much circumstantiality. At the same time there are statements in circulation to the effect that Russia and England have arrived at a proximate understanding as to the localization of the war. This, however, I take to be entirely incompatible with Lord Derby's recent dispatch declaring the isolation of Russia.

OUR FLEET

is being concentrated as rapidly as possible. At Plymouth, we have now ten iron-clads beside a number of gunboats and dispatch vessels, while in the Mediterranean the following vessels are cruising:

	Guns.	Tons.	Horse-power.
Alexandra, double screw ship	12	9,400	8,000
Devastation, turret ship	4	9,183	5,600
Hotspur, iron-plated ram	3	4,010	3,497
Monarch, turret ship	7	8,322	7,842
Pallas, armor-plated corvette	8	3,787	3,531
Research, armor-plated sloop	4	1,741	1,049
Rupert, iron-clad ram	4	5,284	4,200
Sultan, iron screw ship	12	9,286	8,629
Swiftsure, iron screw ship	14	6,633	4,913
Torch, screw gun vessel	5	570	281
Antelope, iron paddle vessel	3	1,010	646
Bittern, double screw gun vessel.	3	774	851
Cruiser, sloop	4	752	....
Helicon, dispatch vessel	2	945	1,610
Raleigh, iron screw frigate	22	4,780	5,639
Rapid, screw sloop	3	913	460

THE COST OF CANNON,

according the present mode, is pretty well set forth by a return of the annual ordnance accounts just presented to Parliament, from which I extract the following particulars: "The 80 ton gun, prepared with a caliber of 14¼ inches, cost £6491 for material, £2023 for labor, and £1091 for indirect expenditure, making a total of £9675, subject to further augmentation, until the ultimate cost appears as £10,913. Under the head of the Royal Carriage Department is an entry of a "truck for proof of heavy guns," made for the gun factories, and costing in all £1593. This, in all probability, is the large 12 wheeled proof carriage on which the 80 ton gun has hitherto been fired. Proceeding with the account of the guns, we find that during the year 1875-'76, as many as 21 12¾ in. 38 ton guns were made, costing altogether £78,109, or £3719 each. Two 11 in. 25 ton guns cost £4718, or £2359 each; 13 18 in. 18 ton guns cost £18,688, or £1437 each. These last throw a projectile of 400 lbs.; the 11 in. 25 ton guns a projectile of 535 lbs., and the 38 ton guns a projectile of 800 lbs., while the monster 80 ton gun has a projectile weighing 1700 lbs., or fully three-quarters of a ton. Taking the guns of all sizes, down to a 7 pounder of 150 lbs., the entire number made in the year was 527. The expenditure for material was £100,637, and for labor £38,000, with an indirect expenditure of £19,794, making a total of £158,931. Balance sheet No. 2 raises the amount still further, so as to make up a sum of £179,264. The increased expense consequent on the manufacture of larger guns is shown by the price per ton, which is £80 for a gun of 18 tons, £94 for a gun of 25 tons; £98 for a gun of 38 tons, and £136 for a gun of 80 tons."

THE DARLASTON IRON COMPANY.

Last week a further meeting of the unsecured creditors of the Darlaston Steel and Iron Co. was held at Wolverhampton, at which the investigation committee recommended the acceptance of five shillings in the pound—half in cash and half in debentures. It was stated that the net amount of assets divisible among the unsecured creditors would be £33,000, or equivalent to 3/8 in £1—an offer which the meeting decided to accept.

LAST WEEK'S FAILURES

were not very numerous, but among the number was that of the South Durham Iron Co. (Limited), of Darlington, on the strength of a petition being presented for winding up the concern by a leading Teeside firm. It is expected, however, that the assets will be sufficient to meet all demands if the large stock of pig iron now in stock can be realized. At Birmingham the creditors of Mr. J. H. Hope, jeweler, met and received a statement of affairs, showing liabilities £4744, and assets, £3247. At Liverpool the creditors of Messrs. Lockhart & Dempster, merchants, were told that the debts were £167,985, and the assets, £8333. At Dewsbury the statement of accounts presented to the creditors of John Lee & Sons, blanket manufacturers, showed liabilities £73,164 and assets, £34.

THE LABOR DISPUTES

in different parts of the country are beginning to be rather serious. The Clyde shipwrights are still out, and there is no chance of an early settlement. The government has offered employment to a large number of the men at £68. 8/9 per annum for four years, or £73 per annum for ten years continuous service, in addition to food and clothing. A number of men have accepted the offer, mostly on the four years' term. In Northumberland about 25,000 miners have come out on strike to-day against a proposed reduction of 10 per cent. At Darlaston and Smethwick about 500 men have struck against a reduction, while in the wrought nail trade the dispute continues as before. At Blackburn (Lancashire) 500 iron workers have struck for an advance. To-morrow

THE ANNUAL CONFERENCE

of the Miners' National Union will meet at Durham, when, among other matters, a proposal put forward by the West Yorkshire district recommending that all the mines in the Kingdom be laid off for a month or six weeks will be considered. Further, our friend,

MR. MACDONALD, M. P.,

has been advising again, this time that the men should have an advance of wages. The occasion for this *sensible* advice was a miners' meeting at Hamilton, Lanarkshire, on Thusday last. A summarized report of the great man's speech runs as under:

"He contended that the cry that the trade of the country was being driven in foreign channels was a bugbear got up as a scare when there was no occasion, and when "British interests" were affected it arose from higher education and a better arrangement of labor on the part of their competitors, and not from any giving way in the solid trade of the country. He strongly condemned the process of "stuffing," which he alledged existed in some classes of manufacture, and which was doing more than the combinations of workmen to drive the country out of the market. In regard to wages, he maintained that the miners were entitled to an advance by the state of the market, and that a demand should at once be made upon the employers to that effect. The miserable plight in which the men were was due to their own folly, but if they only acted discreetly and in combination they would be able to carry their point."

It was unanimously agreed to demand a rise of 6d. a day.

SCOTCH PIG IRON

has been rather quieter, but in respect of shipping the demand has been fairly well sustained, as is shown by the total for the week. There are now 137,126 tons in Connal's stores—an increase of 754 tons during the week. Freights are quiet to your ports, but stiffer to some of the Mediterranean ones.

Writing from Glasgow May 25th, James Watson & Co. said: "The market has been irregular this week, with only a limited business doing. It opened dull on Tuesday at 54/4, but advanced on Wednesday to 54/8 per ton, closing that afternoon at 54/6¼. Yesterday was observed as a holiday, and to-day the price has declined from 54/5 to 54/3¼ per ton, closing sellers at 54/4, buyers 54/3, cash. Shipments last week were 11,547 tons, against 9510 tons in the corresponding week of 1876." We quote.

	No. 1.	No. 3.
G. M. B., at Glasgow	56/	52/3
Gartsherrie, "	64/	55/6
Coltness, "	68/	56/
Summerlee, "	60/6	54/6
Langloan, "	63/6	56/6
Carnbroe, "	57/	54/
Calder, at Port Dundas	62/6	54/
Glengarnock, at Ardrossan	60/6	55/
Eglinton, "	57/	53/
Dalmellington, "	56/6	54/
Shotts, at Leith	60/6	56/6
Kinneil at Bo'ness	57/	53/

The quotations of John E. Swan & Bro.'s prices current, of same date and place, are within sixpence of the foregoing.

THE CLYDE SHIPMENTS

last week comprised machinery worth £9500; castings valued at £22,000; pipes and tubes worth £3000, bars set down at £1400, and miscellanaous valued at £3700. Beside these there were ten engines and tenders, a last lot sent off by Messrs. Neilson & Co., of the Hyde Park Works, Glasgow, who have been making a large number of locomotives for the Indian railways.

THE CLEVELAND IRON TRADE

is quiet, and stocks are increasing in all directions. The Lofthouse Iron Company have camped down their two furnaces, and the furnaces of the South Durham Company are put out. Bolckow, Vaughan & Co., however, are blowing in six furnaces, which will make ordinary Cleveland for a month, and will then make spiegeleisen and hematite pigs. In this connection I may state that out of 160 furnaces in the North of England only 108 are in operation. Of 149 in Staffordshire, 47 are blowing. Of 157 in Wales 113 are working. In Scotland 111 out of 154 are blowing. It will thus be seen that Staffordshire is worse off than any other locality.

Messrs. Wm. Colvin & Co. (Glasgow, May 29th), say: "The pig iron market was firm on Wednesday last, and a fair business was done from 54/6 to 54/8, cash. On Friday the tone was quiet, closing with sellers at 54/4¼. Yesterday a good many transactions took place between 54/1¼ and 53/10½, buyers remaining at 54/. To-day the market has been steady; only a limited business was done between 54/1¼ and 53/11, buyers at the closing offering 54/, cash. Makers' iron is again rather easier, as under:

Deliverable alongside.	No. 1.	No. 3.
G. m. b., at Glasgow	56/	52/6
Gartsherrie "	62/6	55/
Coltness "	67/6	56/
Summerlee "	60/6	54/6
Langloan "	63/6	56/
Carnbroe "	57/	53/6
Monkland "	56/	52/6
Clyde "	57/	53/6
Govan, at Broomielaw	56/6	53/6
Calder, at Port Dundas	65/	56/
Glengarnock, at Ardrossan	60/	54/6
Eglinton "	55/6	52/6
Dalmellington "	56/6	54/6
Carron, at Orangemouth	65/	64/
" " specially selected.	70/	—
Shotts, at Leith	62/	57/
Kinneil, at Bon'ess	57/	53/
Bar Iron	£6. 15/ to £7.	—
Nail rods	£7. 10/	—

SHIPMENTS.

	Tons.
Week ending May 27, 1876	10,696
" May 26, 1877	10,566
Decrease	130
Total decrease for 1877	1,798

TRADES OF SHEFFIELD.

Very few establishments have reopened their doors after the usual Whitsuntide holidays until to day. Generally speaking the state of trade here is not at all good, nor are there any indications of a prospective improvement. At the same time it is highly probable that the business which is being transacted is on a really sound basis, so far as the question of "kite-flying" by means of paper is concerned. This does not afford the inference that the production is large, but it is a good sign that even in these times the district has escaped any large failure of persons or firms actually engaged in the iron trade or its allied industries. This state of things, it is true, has only been maintained with difficulty, and should money grow much dearer, or business experience further restrictions, awkward questions of credit might yet have to be settled; still, in the meantime, it is a subject for congratulation that no large or serious failures have taken place.

In several directions it is becoming more forcibly apparent that if we are to meet our various foreign competitors with success, we must not only be prepared to produce at a cheaper rate, but must take every possible advantage of the facilities afforded by the use of mechanical appliances wherever they can be made use of. On the continent, the French, Belgian, and German steel works are securing almost all the orders for rails and other railway requisites, several large contracts for steel rails having just been taken by Firminy, Creusot, Denain, and other establishments, in spite of the closest competition our manufacturers appear to have been able to offer. From the Cape of Good Hope and from the Antipodes we are continually learning of the marked progress which the American hardwares are making in the estimation of dealers and consumers, and a beginning of the same sort is being made in various Eastern markets as well as in South America. From Italy we learn that a special sample of American hardware has been shipped over in charge of an agent, who will travel through the country and push his goods in the best way he can. Russia, we know, is showing an unmistakable preference for agricultural implements of United States make, and although the trade may just now be interrupted by the war, it is an established fact, and as such merits stern and unflinching recognition at the hands of British manufacturers if they have any desire to compete for this branch of business—one of the largest carried on with Eastern Europe. Coming still nearer home, we have just got an active American competition in our very midst, a large establishment in this town having its show windows full of "Yankee notions" of all kinds—from mouse traps and cherry stoners up to axes, saws, and frame augers, with many intermediate steps in the shape of flat-irons and other minor domestic utilities. All these things are well finished, the casting being particularly clean and well defined as to pattern, and the whole being palpably made not only for use, but for use in the most handy and labor-saving way. These goods are shown by Mr. Smith, ironmonger, Norfolk street, Sheffield, and attract a small crowd of people all day long.

The annual report of the Parkgate Iron Company (Limited), near Rotherham, was issued to the shareholders on Saturday last, and is a document of representative interest at this juncture. Its principal passages are these: "The works and machinery have been maintained in an efficient state with the exception of the rail mill, for which there is no immediate prospect of employment. The cost of the new engine and shears in the guide mill, and of relining and renewing the stoves of the No. 1 blast furnace at Parkgate, amounting to about £2000, has been charged to the revenue account. The directors regret that a bad debt with S. Whitham has been made, amounting to £2795. 9/6, the whole of which has been written off. The property of Scholes has been sold, and also some of the minerals of Parkgate, for £5039. 0/2; this amount has been deducted from the value of the plant. The minerals under a plot of land adjacent to the works—the surface of which was recently purchased—have been bought for £795. A sum of £10,000 has been transferred from the reserve fund to the revenue account, so that, after writing off the usual sum of £2000 for depreciation on plant, providing for all other charges, and writing off the balance of loss from the last two years, a sum of £627. 16/1 is carried forward to the credit of the current year. The depression in the iron trade has been unparalleled in the history of the company. The stocks have been valued at the depreciated market price of the day, and have thereby materially added to the loss on the past year's working. The loss on the company's trading, including the bad debt and the depreciation in the value of the stocks, already referred to, has been £3169. 11/. In consequence of the unprofitable operations of the company the directors have reduced their remuneration to the extent of £500 for the past year." I may add that the paid-up capital of the concern is £194,875, and among the assets are land, buildings and machinery, £207,349; stock of iron, &c., £40,715; locomotives, &c., £9199, and book debts, £16,450. There are "sundry creditors" to the extent of £61,359, and a reserve fund of £11,684.

The annual report or the Hollamshire Steel and File Company, Limited, has also been issued, and is a document of a more favorable nature than the foregoing. The directors state that the net profit of the year's working is a profit of £4818, after expending £893 in removing and rebuilding file shops. Out of the balance a dividend of 10 per cent. is declared. During the year a new mill has been erected.

On Saturday the new lines of tramways belonging to the Sheffield Tramway Company, from the center of the town to Hillsborough and Owlerton, were opened for traffic, and have since done a large business with 10 cars, constructed by the Starbuck Company, Birkenhead. These cars are fitted with the Hadfield patent crucible steel wheels, which are stated to be about 1 cwt. lighter than the American car wheels, and to work easier on the rails.

Last week the shares of the late Mr. Joseph Mitchell, of Swaithe & Edmund's Main Collieries, were put up by auction at Barnsley. The Dodsworth Road Colliery, as a working concern, was withdrawn from sale, owing to the reserve, £4000, not being reached. The next lot was 104 fully paid up £2. 10/ shares in the Worsboro' Dale Gas Company, 80 of which sold at £4 each, and 24 at £3. 18/6 per share. There was also a lot of 102 shares of £20 paid up in the Mitchell's Worsboro' Dale Foundry Company, Limited, which were withdrawn, owing to the highest bid being only £7 per share.

It is not a matter strictly germane to my ordinary trade report, but I may state that the Leeds corporation have given an order to Messrs. Walker & Hall, of Sheffield, for a complete dinner service of silver plate. The same house has also taken an order from another source for £2000 of silver spoons and forks, mostly in competition with London houses.

STAFFORDSHIRE AND BIRMINGHAM.

The iron trade of these districts has been quiet during the week, owing to the holidays and other causes. All prices are unaltered, although there is a constant and growing tendency to underselling in all directions. The production of the district is still small, and now that work is being resumed prospects are anything but bright. In hardwares there is a fair business doing, with an attendant general cutting of prices. Wrought iron hinges are lowered 1/ per cwt.; cast wall nails and tile pegs, 6d. per cwt.; copying presses and axle pulleys, a slight percentage; hollowwares a trifle weaker; brass washers, ¼d. per lb., and brass cocks, 2½ per cent. more discount. In the tin plate trade the Welsh masters are inviting the Shropshire and Staffordshire houses to unite with them in limiting the make.

OUTH WALES AND MONMOUTHSHIRE

are, on the whole, rather better employed, and are shipping more iron than for a long time past. Last week all the Welsh ports sent off 6170 tons of iron. The best employed concerns are Rhymney, Dowlais, Ebbw Vale and Tredegar. Dowlais is running on rails for Montreal, Ebbw Vale for Kurrachee and Palma, and Rhymney for Sandswall. Cyfarthfa is still only very poorly engaged. Ebbw Vale continues to import iron ore very largely from Spain, in the evident expectation of an early improvement in trade.

THE METAL MARKETS

have been quiet all round.

Von Dadelszen & North report: "*Copper* has been dull. Chili bars have been sold to a moderate extent, at £68. 10/ for g. o. b. The charters for first half of May were 1450 tons to the United Kingdom and 50 tons to the continent. Wallaroo, on the spot, is held firmly for £76. 10/. For delivery, ex sale, business has been done at £76; and a small lot of Burra sold at £74. 10/. English quoted £75 to £76 for tough, £77 to £78 for select and £81 to £82 for sheets. At the Swansea ticketing Cape ore sold at 13/7½, the average of the whole sale being 13/6. *Tin* has been flat and declining; business in Straits from £70. 10/ to £69. 10/, and Australian from £70 to £68. 10/, closing at the lowest. In Holland little doing; Banca quoted 43fl. and Billiton 42fl. English ingots quoted £73. 10/ to £75. Tin plates steady. *Lead* dull and lower. English pig quoted £21 to £21. 5/; soft Spanish, £20. 10/ to £20. 15/. *Spelter* easier; ordinary Silesian, £20 to £20. 5/. *Sheet Zinc.*—Of 140 tons offered at public sale, only 65 tons sold, at £24. net. *Quicksilver* dull at £7. 5/ for Spanish. *Antimony* flat; £47 to £48 for star."

Messrs. Kelly & Co. (London) say: "Glasgow warrant iron is still the sport of speculation. Cleveland maintains its firmness. Other iron centers are without material change. *Copper*, easier. *Tin*, quiet. *Tin plates*, unaltered. *Lead*, the same. *Spelter*, very dull. *Quicksilver*, as last week. *Bar silver*, firm at recent advance (?)."

The *Mining Journal* remarks: "*Copper.*—The position of this metal at present has not undergone any particular change; it has continued its downward course slightly, but the reduction has not been sufficient, and a further decline is necessary before the market will be at a safe figure. The demand is slack, and smelters cannot accept the limits offering for manufactured without being able to buy Chili bars at least at 20/ to 30/ per ton cheaper, but it is doubtful whether large quantities could now be placed at such a good price. *Lead.*—Our market has been quiet, and prices are further reduced 2/6 per ton, ordinary English pig being £21 and Spanish £20. 15/ per ton. *Spelter.*—Silesian dull; prices slightly in favor of buyers. *Quicksilver.*—No change; demand limited.

Latest Liverpool prices are:

Iron: f. o. b. in Liverpool, per ton.

	£	s.	d.	£	s.	d.
Merchant bar	6	12	6 @	6	15	0
Merchant bar, in Wales	6	2	6 @	6	5	0
Staffordshire	7	0	0 @	9	15	0
Hoop	7	10	0 @	8	10	0
Sheet	8	15	0 @	9	15	0
Nail rod	7	10	0 @	8	0	0
Bar, best crown	7	0	0 @	8	0	0
Boiler plates	9	0	0 @	10	0	0

Tin Plates: f. o. b. in Liverpool, per box.

	£	s.	d.	£	s.	d.
Charcoal, I. C	1	2	6 @	1	4	0
Coke, I. C	0	18	0 @	1	0	0

Copper: Delivered in Liverpool, per ton.

	£	s.	d.	£	s.	0
Bolt and Sheathing	84	0	0 @	0	0	0
Tile	78	0	0 @	0	0	0
Tough cake	78	0	0 @	0	0	0
Best selected	78	0	0 @	0	0	0

Breaking Strain of Wire Rope.—The following table, showing breaking strain of ropes of 133 wires, is from a pamphlet by Messrs. J. A. Roebling's Sons:

	Diameter. Inches.	Strength. Tons.
No. 1	2¾	74·00
No. 2	2	65·00
No. 3	1¾	54·00
No. 4	1½	43·60
No. 5	1⅜	35·00
No. 6	1¼	27·20
No. 7	1⅛	20·20
No. 8	1	16·00
No. 9	⅞	11·40
No. 10	¾	8·64
No. 10½	⅝	5·13
No. 10⅝	9-16	4·27

A singular fact with reference to the production of heat is described by M. Olivier in a recent paper. A square bar of steel 15 millimeters thick and 70 to 80 centimeters long is seized with the two hands, placed one at the end, the other in the middle of the bar, and the unoccupied end is pressed against an emery grindstone turning rapidly. In a few minutes the rubbed end is considerably heated. The hand at the middle has no sensation of heat, but that at the extremity is painfully hot, so that it has to be taken from the bar. Thus in certain cases heat appears not to be propagated in metals from one part to that next it.

An American officer named Sale is said to have invented an aerial machine for use in warfare. It consists of a slight framework, covered with loose canvas, which becomes filled with air, and thus the apparatus is kept afloat. In order to make observations of an enemy's camp at night the machine is made fast, and a kind of parachute provided with fire balls is sent up the line, which at the proper point ignites the fire balls, and thus illuminates the surrounding country for a considerable distance. A trial of the apparatus is said to have been satisfactory.

A Manchester mechanic has invented a horse-shoe composed of three thicknesses of cowhide compressed into a steel mold and then subjected to a chemical preparation. Its inventor asserts that it lasts longer than the common shoe and weighs only one-fourth as much; never splits the hoof, and has no other injurious influence on it; requires no nails, even on asphalt; is so elastic that the horse's step is lighter and surer; and adheres so closely that neither dust nor water can penetrate between the shoe and the hoof.

The rapidity with which the manufacture of pottery has increased in this country is shown by the falling off in imports, the reduction being mainly 50 per cent. in 10 years, 75 per cent. of which reduction has taken place within five years, while labor is 100 per cent. higher than in England, with a protective tariff of but 40 per cent.; yet we compete successfully, both in quality of work and prices, owing to the introduction in this country of improved labor-saving machinery. The center of this industry in America is East Liverpool.

The Washburn Car Wheel Company, at Worcester, Massachusetts, recently started their foundry after an idleness of two years, and are to work on their newly invented, simple method of combining a cast iron wheel with a half steel tire, with the prospect of soon enlarging the works.

THE NATIONAL ASSOCIATION OF STOVE MANUFACTURERS.

[*By Telegraph to The Iron Age.*]

DETROIT, Mich., June 13, 1876.

The National Association of Stove Manufacturers met here to-day, Mr. S. S. Jewett, president, in the chair. About fifty members responded to the roll-call. Much interest was manifested in the subjects presented for discussion, and committees were appointed to prepare business for to-morrow. It is probable that no reduction will be recommended in the basis of prices for the ensuing half year. The feeling in the trade is one of uncertainty, and the outlook for the season's business is considered unsatisfactory. The production of the year is likely to be not over two-thirds average of the past year.

The following is the address of President Jewett:

GENTLEMEN OF THE ASSOCIATION: In accepting the cordial invitation of our Detroit friends to meet with them at this delightful season of the year, it may have seemed to some as though it was a place in a State quite distant; or, perhaps, a town "out West" where we should see the streets all at right angles and parallel in strict mathematical order, and lined with the varied architecture of our day in its most attractive form.

The word "Michigan" is of Indian origin, and signifies "the great lake." The name was originally applied to the great lake, which formerly included in one body the waters now separated by the peninsula and known as Lakes Huron and Michigan. "Michigan," therefore, as applied to the contiguous territory, means "the land by the great lake." At this time permit me to be more precise, and entitle it "the land between the great lakes." Michigan is, indeed, included among the Western States, and the years of her greatest growth and prosperity are very recent. Yet there are facts in her history which place her in close alliance with the Eastern States. This locality was originally explored and its settlement commenced in the early part of the seventeenth century, not many years after the date that New York city claims to have been founded by the Dutch (1615). The land was then the home of various tribes of Indians whose deeds have appeared notorious through the influence of the French—who were the first white settlers—and of the English, who subsequently occupied the land. Michigan took no active or representative part in the war of the American revolution, as her soil was then the resting place of the enemy. From this vicinity, in 1776–7 and ensuing years, the native Indian tribes were incited to make expeditions against American settlements, and on their return they presented the scalps of our ancestors to the English commander in the old council house at Detroit, and were then paid for their services. For these and similar deeds the race has been almost annihilated; the remainder inherit the ancient hostility, and will never abandon it until their career is ended. In 1796 the first American banner was raised over the soil of Michigan. In 1805 the Territory of Michigan was organized. In 1811 there were only nine principal white settlements in the territory, and also a few scattered cabins of the more daring settlers, the total population being 4860 souls. This meager result was mainly due to the isolated character of the country, for it was not easy of access to ordinary settlers. But in 1817 an enterprise was inaugurated in the Empire State and completed in 1825, which ranks among the famous works of man. The Erie Canal then was completed, and became the highway of travel and commerce between the great lakes and the seaboard. Then Michigan was stirred with the impulse of a new life. The thrifty residents of the New England and Empire States heard of the attractions of Michigan and at once moved onward to enjoy them, thus bringing to it abundant capital, and, what is better, the highest grade of character, the outgrowth of our own civilization—American settlers by birth and education, a rare nucleus, truly, for the future growth. In 1831 the United States government first commenced to erect lighthouses and locate buoys along the coast for the benefit of its increasing commerce. In 1836 Michigan became a State and took her place in the Union, a peer with all the rest. A proud record she has unfolded to the world. In commerce, from her 50,000 square miles and along her 1200 miles of lake coast, she has poured out her treasures of grain, fruit, lumber and minerals, which have contributed fabulously to our national wealth. In civilization, her educational system is famous. In population, she has grown to a State embracing over 1,500,000 persons. In finances, Michigan sets a rare example to her sister States, being practically free from debt. In patriotism, no State excels her; her devotion to the Union has been proved by the prowess of her citizens; the roll of honor is crowded with the names of her illustrious sons.

The City of Detroit, though settled at a somewhat later date than places now of less note, is very much older than many cities farther east that now excel her in size. In early days it became a prominent point in the fur trade. In 1805, the settlement, covering but two acres of land, was burned to the ground. In 1839, the city contained a population of 10,000 persons. Her system of streets is peculiar, combining the modern regularity with the relief of a few diagonal streets, all being wide and attractive. In architecture are seen some rare specimens of modern architecture, also interesting examples of the style in former times. I presume that the older residents could point out to us many buildings of great interest, from their antiquity, perhaps some erected by the ancient French peasantry. But a short distance from this spot stands St. Anne's Church, which belongs to a society that has been in existence here since 1701. The present stone edifice, however, was not commenced until 1822 or 1823, and completed in 1827. Several changes have since been made at different times, but it, as well as the adjoining residence, stood substantially in their present form in the year 1826. From such a starting point, notwithstanding the removal of the State Legislature to Lansing, Detroit has become the commercial metropolis of the State, and possesses all the advantages enjoyed by places similarly located. A great state is steadily supporting the growth of Detroit, and will maintain it through all time as a center for the commerce and manufactures required by the rich territory tributary to it. Let us rejoice with the citizens of Detroit over their prosperity during the past, and wish for them that it may be renewed and increased in the years to come.

THE STOVE TRADE.

The stove trade, although languid, as is to be expected at this season of the year, is more restricted in volume than usual. This tendency is confirmed by information received from all sections, and is detected by comparisons with the records of previous years. It is a sure indication that buyers will continue to exercise the caution which experience has forced them to adopt. The wisdom they have so dearly learned will not be soon forgotten. I cannot overlook the fact that there is every promise of a bountiful harvest—a season, probably, of unusual abundance, which will improve the condition of consumers, but cannot induce purchases beyond the actual necessities of life. Even if the crops of 1877 are unusually profitable, consumers have not only to provide payment of arrears created by the past, but they must also provide for a future against which there is no existing guarantee. The temporary benefit of foreign disturbances is clouded by the reflection that modern wars are seldom protracted, and their influence uncertain.

This idea is happily stated in a recent number of the New York *Shipping and Commercial List*:

"There may be temporary advantage to one nation in the disasters of another, but in the long run all must suffer together. Continued prosperity in a community depends on mutual advantages. So it is in the community of nations. Let one's share in the commerce of the world be destroyed or seriously impaired, and the others inevitably suffer from it. Whether the Eastern war shall be confined to Russia and Turkey, or shall involve other nations of Europe, it cannot be regarded as in any sense a blessing to the United States. War is a misfortune to the world, in which we must take a share, whether we will or no, and the greater its proportions shall become, the more destructive will it be to commercial interests, on which our prosperity so largely depends."

Taxes and expenses are inevitable, and for them the surplus in prospect should be carefully husbanded. Manufacturers must appreciate fully this fact, and realize the disposition of all classes to provide for the future, so as to adopt a policy consistent with it. I cannot commend too highly the firms who have settled upon a limited production, and are proceeding cautiously in every department of their business. Extreme economy in every detail of manufacturing, constant discretion in granting credits, and persistent diligence in making collections, are the elements that must pave the way to success. The records of the future will exhibit the names of those only who have been governed by these principles. They alone can pass safely through these perilous times, and emerge from the terrible ordeal strengthened and purified by the trials of the past.

In this connection permit me to call your attention to a policy hitherto pursued by the government of the United States.

The payments on the United States debt since the close of the great war have been an unnecessary burden for the present generation to assume. To carry it, in addition to the immense payments of floating debts, and in addition to the state, county and municipal indebtedness created to sustain the government, while at the same time providing for current public expenditures, has seriously impaired the financial strength of all our citizens. Investors in United States bonds seek safety only for their principal, without expecting its early return to them by the treasury. The safety of the bonds renders them convertible into money in open market as long as the interest is paid regularly at maturity. There can be no good reason for a further continuation of this suicidal policy in the present condition of finances, which is forcibly stated by President Babcock, of the New York Chamber of Commerce, in his recent address to President Hayes:

"I feel bound to say that at no previous period in the last thirty years, has the business of the country been more depressed and unsatisfactory than at the present time."

Cease this unwisely rapid reduction of the national debt, and let the money to be extorted for that unnecessary purpose (largely to repay foreign creditors) remain where it is, to be used in commercial transactions. Stop this drain upon the life-blood of the people, in order to restore health to our financial body, and permit our great natural strength to recruit itself. Prosperity will then gradually thrust adversity into the background, and raise the nation up to the position which its natural resources justify, if free from the injudicious policy of the past.

By thus reducing public expenditures, and by persistent economy in future appropriations, without any reduction in the volume of the currency, a steady financial policy exists, under which the natural growth of population will gradually utilize in increased exchanges whatever inflation there may be in the currency; the constant increase of agricultural and mineral products will add rapidly to the wealth of the country; capital will be secure, labor employed, the national debt no longer a burden, and the United States currency as good as gold.

It is with profound gratitude that we here record that the political dangers which threatened the nation in January, have yielded to wise counsels, and a peaceful termination to the Presidential struggle has restored and increased public confidence in the Constitution of the United States. Strengthen it wherever weakness is developed, but never remove that proud landmark. It has been erected and dedicated to liberty; it has been perpetuated and sanctified by the blood poured out so freely to maintain it; let us do our part to perfect it that it may continue to indicate the land where the rights of every individual are secure, and where monarchical tyranny is carefully excluded.

RECIPROCITY TREATY.

Although I was not present at the meeting of this Association held at Long Branch, yet, feeling the importance of calling your attention to the matter, I considered it my duty to telegraph to your president: "I doubt not your convention will take such action in reference to the proposed Reciprocity Treaty as our interests require." The particular features relating to our trade were then stated, and a few remarks made, but as the subject was new, the matter could not be thoroughly investigated. The following preamble and resolution were therefore adopted.

Whereas, The proposed Reciprocity Treaty contemplates the ultimate removal of duties on stoves and castings,

Resolved, That a committee of five be appointed by the president to represent this Association, and take such measures as will protect our common interest.

I do not find in our records the names of the persons appointed on that committee, nor do I know of any action under the provisions of the resolution. It may have been anticipated that the Congress would so delay action as to render it unnecessary to call out such a committee, or it may have been ascertained that the treaty in its existing form could not be enacted. Thus, the proposed treaty has slumbered in our records, and escaped our earnest attention. More recent circumstances have, however, reminded me of it, and induced me to make brief allusion to it at this time. That treaty failed, but the projectors of it have not ceased their efforts to further it. The inducements to secure the adoption of such an international system still exist across the border, and animate the leaders in Dominion legislation constantly. It is now a prominent, absorbing subject, ever present in their minds. That group of able men are scheming to bring up the matter at no distant day in a form as attractive as possible, and clothed with language as fascinating as the cunning of skilled diplomatists can contrive. It becomes, therefore, a question of immediate interest to this country, and it will pay us well to dwell upon it, to give it earnest, thoughtful consideration, and to individually exert our influence to secure the advancement of the interests of the United States.

It is unquestionably our duty to cultivate friendly relations with all nations. It is undoubtedly a natural privilege, and also for our interest, to sell our product, or buy our supplies in open market, wherever we think best, without artificial restrictions. Such a theory, however desirable and possible it may be among persons enjoying the same government, where all circumstances exert an impartial influence, becomes difficult to practice when attempted between the inhabitants of different countries, where diverse elements prevail, and commerce must be regulated by treaties.

There can be no difficulty in the negotiation of commercial exchanges between two nations which enjoy the same privileges and submit to the same or like difficulties. In the present instance the circumstances differ greatly; the privileges and difficulties are radically different the moment the line is crossed. While we have experienced the untold blessings of a long period of freedom, we need take but a step to reach a dominion still cringing beneath the yoke of a foreign power. These words need no qualification when used here, as all the trade regulations of Canada have always been made subordinate to the wishes of the mother country. While we generously extend to all inventors of every nation the same protection as we grant to our own mechanics, our neighbors have ingeniously erected a structure, ostensibly liberal, but affording no protection to foreign skill. Their system limits the avowed permission to obtain patents there by such peculiar provisions as to be of little or no advantage to us in a reciprocal sense.

The value of land is different; the rate of wages not at all alike; the hire of money is on a different scale; the price of raw material, consequently, differs; the laws there are enacted according to a foreign standard, while ours relate intimately to the wants of this country; and, lastly, what is of more importance, they are free from the drain of a great war, with its never-ending stream of taxation drawn from every possible source. As all of these points affect the cost of manufactured articles, I can hardly conceive of any feasible plan to secure free commercial exchanges with our nearest nation.

Furthermore, with the most absolute equality in all these matters, there still exists the difference in the size of the markets, between which relations more or less intimate must exist. To open a large market to unrestricted intercourse is surely a greater privilege than to be allowed to enter into a limited territory, where a restricted demand exists. How to consider this point or to estimate its value there is no time now to discuss; but that it has great weight with the Dominion there is no doubt in my mind. It is a great idea now stimulating their principals to renewed exertions for the removal of the barriers which we are forced to erect for revenue protection. What they need of us they are permitted to buy without any restrictions, unless self-imposed. They want entrance for their products into our great market free from our expenses. This is the whole matter in a nut-shell; this we are bound to prevent by every means in our power.

I desire to be clearly understood as in favor of the utmost freedom for commerce between Canada and the United States; but I do not consider it possible, under existing circumstances, to negotiate a treaty that will embody the principles of true reciprocity. Were Canada free from her dependency upon England, and ready to enter as a State into our Federal Union, where the privileges and burdens could be made more equal, it would afford me, and, I have no doubt, all of you, the greatest pleasure to welcome their citizens as our brethren, bound together in one common interest.

Before dismissing this important subject, I desire to refer you to the remarks concerning it which were made by your former president, in his address at Chicago, in 1875.

Permit me, also, to call your attention to a pamphlet, which I received since the above was written. It is entitled "Canadian Reciprocity," and was published by the American Iron and Steel Association. Upon my request, the secretary of that association, Mr. James M. Swank, has very kindly furnished us a number of copies for circulation here; you will find them upon the desk of the secretary.

OUR NOMENCLATURE.

In my last address, I called attention to some of the grotesque and hurtful features of our nomenclature; and I refer to it again at this time because I cannot too strongly emphasize my objections to the use of absurd or stupid names. When we consider that there is nothing particularly suggestive of humor or buffoonery in the wares we offer, and that the selection of a stove, range, or heater is a matter which is likely to receive serious consideration at the hands of the purchaser, our warrant for wearing the motley while presenting our manufactures to the public, is not at all clear. You have already had submitted to you samples of names that can only be classed as pompous or meaningless, many of them repeated over and over again, as you will learn by consulting the register compiled by the secretary of this Association; and to a certain extent, at least, you have been made acquainted with the various tastes of the manufacturers, as they have found expression in the names given to their works. Royalty was ransacked for all its titles; those of astronomical tendencies reveled amid all sorts of suns, moons and stars; mythology was required to yield up its quaint treasures; the floral world was drawn upon as far as it could be considered safe; and generals and dwarfs, volcanoes and fire flies, mountains and fairies, gold and greenbacks, alligators and jewels were found associated in this queer aggregation of names. Many of the titles seem to have been determined upon in sheer despair, others as if to indicate the perpetration of some huge practical joke upon the community, and still others as if their authors were in the very last stage of helplessness. Of course there are agreeable names in our list, and fanciful titles, to which a greater or less degree of significance attaches; but even in the midst of these we find names which are wanting both in appropriateness and meaning. We have a large variety of Homes and Cottages, radiant and rural, of the West and of the South, brilliant and cheerful, of the Swiss order and of the forest, but what would the purchaser understand by a Silver Moon Cottage or a Pearl Cottage? Mahomet's virgins of paradise are supposed to be supplied with homes of pearl, but for ordinary work-a-day people, such as we have to provide with apparatus for cooking and heating, these silver moon and pearl cottages are altogether too exquisite, both in material and architecture. Then there are Stars without number; but their manufacturers would not feel complimented if a purchaser should inquire how many years were required for them to transmit their light and heat to this little globe of ours for purposes of utilization. Starlight answers an excellent purpose; but for roasting and broiling, or for solid comfort on a cold winter night, it has never been regarded the correct thing. A Smooth Cannon is offered by one distinguished firm, but whether it proves to be anything more objectionable than a great bore, certainly the name is a formidable one and calculated to excite awe in a small family. Of course, Ajax has to be true to the traditions, and must continue to defy the lightnings. A Torrid Egg may be an improvement on a hot brick, but most people will prefer to have their eggs fresh, and not congested, addled or badly cooked. One firm of my acquaintance boasts of four Leaders, has in its family a number of Victors, and talks familiarly about Fame and Conquest. Another indulges in mottoes and exclaims, Eureka! and Excelsior! while still another soars to Alpine hights or inhales the rarified air of the Andes. Parlors are pretty badly abused. Various firms are represented by certain individual qualities or attainments, and so we have Dash, Pluck, Progress, Reform, Satisfaction, Success, Peace, Fearless, Complete, Grand, Reliable, Cheerful, Perfect, Superior, Relief; and we have also a New Reliable, and a New Dauntless, and many other sorts of News not found in the journals of the day. One firm runs to the Gothics; another cultivates the Knickerbockers; still another supplies a queer assortment of Cooks; and one establishment takes pride in a family which includes a couple of Belles, a Fire King, a Forest Queen, an Enchanter, a Giant, a Prairie Farmer, a Black Swan, a Reindeer and a Salamander—a family which would win a fortune for Mr. Barnum in a single season. There is an establishment represented here, one of whose proprietors must be descended from Alexander the Great, for he is not satisfied with being Invincible and the possessor of a Crown, but talks as flippantly about Empires and Worlds as if the universe were his to rule. Some are satisfied with a Log Cabin and a Good Record; others demand Gems and Treasures; others exhibit destructiveness, and delight in desolation, since their sympathies manifestly go with Volcanoes, Whirlwinds, Tempests and Tornadoes; and I am sorry to add that there are those who are satisfied to be known of all men for their Spitfires and Wasps. Among the more delightfully felicitous names are Fancy Dwarf, Monkey, Muzzy, Dingo, Little Joker, Vulcan Egg, Odd Fellow, Snow Bird, Cabinet Maker, Truly Yours, Shoo Fly, Gilt Edge, Old Man and Wife, Scorcher and Red Hot. These are only samples; but to extend the list to its full limits would but weary your patience, without adding force to the point of my remarks. I repeat here what I had occasion to say when I first called your attention to this matter: "I leave you to prosecute further investigation for yourselves, and to correct, as far as you may deem proper, the tendency to employ ludicrous, grotesque, vulgar or high-sounding names with which to designate your manufactures."

ADVERTISING.

On a former occasion I deemed it proper to call the attention of the Association to the methods of advertising pursued by many, and a simple analysis of some of them was all that was required to show their worthlessness. The tawdry lithographs so freely used by manufacturers neither express good sense nor good taste; they suffer even by comparison with the comic valentine, for although the latter is essentially vulgar, and frequently a hurtful missile in the hands of a foolish or a malicious person, it means something—it embodies a remote suggestion of a caricature—it has about it some touch of humor—it tells for what it was designed—but the stove manufacturer's valentine—I mean his red and yellow lithograph, has no redeeming qualities about it. At best it but announces the thoughtlessness or want of dignity of its author; and if it does not hint with a certain degree of positiveness at the probable inferiority of his wares, it is less injurious than I have been inclined to regard it. If the pictorial art must be called into use in our business, there are excellent designers and engravers who can illustrate our manufactures accurately—brilliantly, if you please—reproducing with photographic correctness every feature of our work, even to the most exquisite conceits in ornamentation; and these are the men we should employ. We can invoke the aid of the artist without any sacrifice of self-respect, without any display of egotism, and with a proper regard for the enlightenment of the public.

Fence advertising cannot be too emphatically condemned—to characterize it as vile is scarcely to do it adequate justice. It is primarily objectionable, because it brings the manufactures we wish to advertise into doubtful company on the public highways; and every prudent business man must know, if he has given to his advertising the careful attention it deserves, that the money devoted to papering fences is utterly wasted. The showman who expends a a hundred thousand dollars a year in glittering and gorgeous illuminations illustrative of his exhaustless zoological resources and arenic wonders, has warrant for his monopoly of the boards in the fact that a large proportion of his patrons is made up of those who, with open mouths and staring eyes, prosecute their studies in the shadows of fences. But this same manager, you will observe, employs other means by which to reach the public—appliances upon which he relies for his best effects. His business requires him, by one method and another, to reach every class of the community, and printers' ink is made to render a varied and invaluable service at whatever cost. He is a scientific advertiser; he may seem reckless in his lavish expenditure of money, but there is method in his madness; and the solidity of his bank account at the close of the season tells the story of the skill, tact and enterprise he has displayed in advertising his attractions. He has a right to the fences; his very audacity almost entitles him to a place on the loftiest hights of the Sierra Nevadas, or at the bottoms of the deepest canyons of the Colorado; there is something truly American in his pluck and energy; but he wastes no money in his use of means to an end. I know a gentleman who expends one hundred and fifty thousand dollars annually for advertising, but you cannot find his name on the fences; he is the best advertiser in the country, but there is nothing comical or grotesque about his way of doing business. Now, the members of this Association who patronize the fences are overshadowed by the great showman, and are compelled to keep company with the small venders of thin nostrums, the proprietors of some three-legged calf, the directors of a fat woman, the patentee of some villainous bitters, or the compounder of pills that are warranted to cure all the ills that flesh is heir to. I have seen the names of good firms brought into this disagreeable relationship, and have felt sorry for them. Those in want of any of the products of our factories are not influenced by this sort of advertising. The flaring poster neither inspires confidence nor conveys the information the public desire; and if we would make the best possible use of our money in giving publicity to our claims as manufacturers, we should patronize ably conducted and responsible newspapers. The newspaper is immeasurably the best medium open to our trade; the most liberal and expert advertisers testify to its value; and in the employment of its columns we would find a means of escape from the wasteful, undignified and ineffective methods to which so many now resort in their eager desire to secure attention and patronage.

THE SEMI-ANNUAL MEETING.

Your action at Troy postponed until this meeting the consideration of the following recommendation of the committee appointed to prepare business for the Association:

"That Article 4 of the Constitution be amended by omitting the semi-annual meeting."

In order to secure for our trade all the benefits of organization and co-operation, it is of the first importance to have at every meeting a full representation of our members from every locality. Without a large attendance our actions cannot be expected to command general respect. Our consultations demand the experience and wisdom of all, to produce the most beneficial results. Hitherto the annual meeting has always presented those desirable features, and the resolutions then adopted embrace nearly all the valuable acts of this Association. At this season of the year many of us expect to enjoy a summer vacation, and carry out some favorite plan for recreation, which invariably draws away from us some of our most valued associates. The amount of business transacted at our sessions does not warrant two regular meetings. It has, it is true, been thought by many of our number that the social influence of repeated reunions was an element of strength to us, and I have expressed that as my opinion heretofore. But I am now constrained to believe that the influence of this Association will be fully maintained by appointing one regular time for an annual meeting. Members will then center upon it all their interest and attention, and more will make a determined effort to meet with us regularly.

It is now a part of our customary duty to add to our mortuary records the names of two members, who have been taken from our ranks during the past two months.

OBITUARY.

Philip Rollhaus, Jr.—The stove trade of New York is called upon to mourn the loss of one of its youngest and brightest members, Mr. P. Rollhaus, Jr., who died Saturday, April 28, at his residence, Livingston street, Brooklyn, after a short illness. Mr. Rollhaus was born in New York, and served his time as a plumber. After finishing his trade he was called to the establishment of his uncle, Mr. P. Rollhaus, and served him so well and faithfully that he was finally admitted as a partner, and eventually succeeded to the controlling interest. At the time of his death he was only 37 years of age, but through untiring energy and constant attention to his business he had placed himself in the front rank of the trade at that early age. He was a man widely respected and loved, as well for his genial, generous and social qualities, as for his strict integrity and upright manly course in all his business connections.—*N. Y. Metal Worker.*

At our Chicago meeting, in 1875, a member of this Association first tendered to us a cordial invitation to meet in Detroit, and presented the matter in the following words: "I am pleased to name Detroit as the proper place for our next meeting. In the summer season there is no point finer than somewhere on the lakes. I name Detroit as one of the pleasantest points that can be selected, with our beautiful river and the facilities we have there for entertaining the Association." We have accepted the invitation, but Mr. Benjamin M. Anthony is not here to extend his hearty greeting. His welcome was given in advance before his departure. Mr. Anthony was the managing salesman of the Michigan Stove Company since its organization, and in that capacity became well known to the trade. His active, impulsive character carried him up to the position so ably filled by him; but while just commencing what seemed to him a permanent season of prosperity, the mysterious forces of his earthly nature ceased to act, and his spirit has escaped to enter into the presence of the Master.

TACKS, LINING SADDLE NAILS

UPHOLSTERERS, GIMP, CARPET, BRUSH TACKS, CIGAR BOX, FINISHING, TRUNK AND CLOUT, CHAIR NAILS, BRADS AND PATENT BRADS, SHOE NAILS, AND SHOE TACKS, BRASS, SILVER AND JAPANNED LINING NAILS, SADDLE NAILS, COFFIN TACKS, TUFTING BUTTONS AND NAILS OF ANY COLOR.

AMERICAN TACK CO. Factory at Fairhaven, Mass. N. Y. Salesroom, 117 Chambers Street.

COMMON, CHISEL POINTED, AND COPPER BOAT NAILS. ANY SIZE OR STYLE OF TACK OR NAIL MADE FROM SAMPLE TO ORDER.

Japanese Paper Ware.

Centennial Award to Jennings Bros. for the manufacture of the Japanese Paperware, Water Pails, Chamber and Commode do. (Slop Jars, Foot Baths and Water Carriers), Bowl and Pitcher, Pans, Basins, Cuspadores, Spittoons, &c., &c.

Warehouse, 372 Pearl St., N. Y. City.
Trade supplied.

NATIONAL Horse Nail Co.

MANUFACTURERS OF

FINISHED

[BRIGHT OR BLUED]

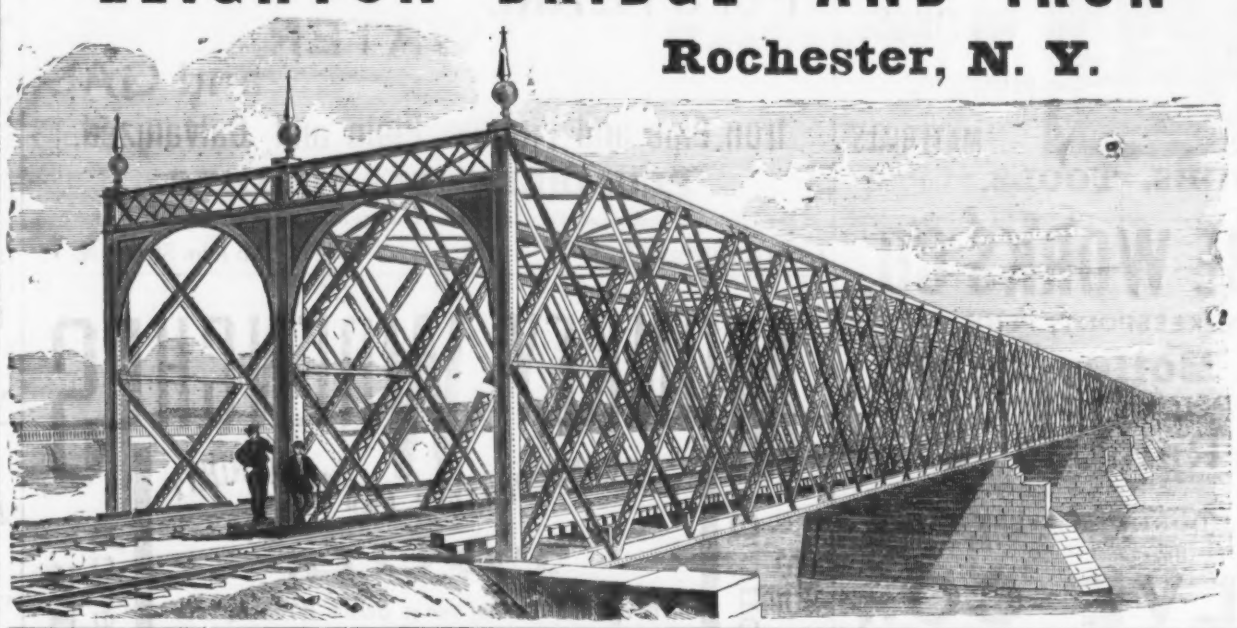
These nails are made of the best brands of **NORWAY IRON,** and are guaranteed to be equal to any in the market.

NATIONAL HORSE NAIL CO.,
VERGENNES, VT

HORACE DURRIE & CO., Agents,
No. 97 Chambers St., New York.

LEIGHTON BRIDGE AND IRON WORKS,

Rochester, N. Y.



Wrought Iron Riveted Lattice Railroad

AND

HIGHWAY BRIDGES.

Wrought Iron

WATER PIPE.

The most economical and durable Pipe manufactured for Water Works, Oil Lines or Gas Mains.

General Riveted Work

Orders Solicited from Civil Engineers and Contractors.

[Accompanying engraving represents the Springfield Bridge, built by the Leighton Bridge and Iron Works.]

SPRING PERCH CO., Bridgeport, Conn.

Established 1843. Manufacturers of FIRST QUALITY

SPRINGS & AXLES

And Beer's Patent Curtain Rollers, Concealed Hinges, Etc., Springs of any pattern made to order. Send for Circular and Price List.

L. COES'

Genuine Improved Patent

SCREW WRENCHES.

Manufactured by

L. COES & CO.,

Worcester, Mass.

Established in 1839.

Registered March 31, 1874.

We invite the particular attention of the trade to our New Straight Bar Wrench, *widened*, full size of the larger part of the so called "reinforced or jog bar." Also our enlarged jaw, made with ribs on the inside, having a full bearing on the front of bar (see sectional view), making the jaw fully equal to *any* strain the bar may be subjected to.

These recent improvements in combination with the nut inside the ferrule firmly screwed up flush, against square, solid bearings (that cannot be forced out of place by use), verifies our claim that we are manufacturing the strongest Wrench in the market.

We would also call attention to the *fact*, that in 1869 we made several *important* improvements (secured by patents), on the old wrench previously manufactured by L. & A. G. Coes which were *at once closely* imitated and sold as the *Genuine* Wrench by certain parties who seem to rely upon *our* improvements to keep up their reputation as manufacturers, and although the fact of their imitating our goods may be *good* evidence that we manufacture a superior Wrench, we wish the trade *may not be deceived* on the question of *originality*. Trusting the trade will fully appreciate our *recent* efforts, both in improvements on the Wrench and in the adoption of a Trade Mark, we would caution them against imitations. None genuine unless stamped

L. COES & CO."

Warehouse, 97 Chambers St., & 81 Reade Sts., N. Y.

HORACE DURRIE & CO., Sole Agents.

WOOD'S PATENT ADUSTABLE HOLLOW AUGUR.

The knife has an independent lip, and *only* requires *resetting* when sharpened. The jaws of this Augur are Steel Castings. The knife and adjusting bolt and nut are *forged* from the best *refined Cast Steel.*

The difficulty heretofore experienced of cutting any and every size, in order to accommodate variation in bits, is entirely overcome in this Auger.

The scales are laid off in sixteenths, from ¼ to 1⅛ inches, and are perfectly accurate when the knife is set so that the tenon will fill the jaws, which, having three bearings, will always make the tenon round and perfect. To cut any variation from the sixteenth, it is only necessary to make an allowance on the scales as it would be done on a rule. In repairing, to duplicate a tenon, close the Auger jaws on the old one and it will cut the new one the same size.

These Augers have been thoroughly tested. The parts are perfectly duplicated, and the material and workmanship are guaranteed.

We offer this as the latest improved and best Hollow Auger in market. It will surely take the preference until something better is invented.

PRICE, $4 each.

MILLERS FALLS COMPANY,

No. 74 Chambers Street, NEW YORK.

HOWARD PARALLEL BENCH VISE.

MANUFACTURED BY

Howard Iron Works, Buffalo, N.Y.

Send for price list.

RUSSELL & ERWIN MFG. CO. NEW YORK & PHILADELPHIA AGENTS.

The Cowles Hardware Co.,

UNIONVILLE, CONN., Manufacturers of

Hardware & House Furnishing Goods

GEO. DUNHAM, Prest. G. S. KNAPP, Treas.
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Screw Drivers of all varieties, Box Scrapers, Box Openers, Garden Hoes, Garden Trowels, Border Knives, Mincing Knives, Fish Turners, Butter Knives, Cake Turners, Cleavers, Hammers, Carpet stretchers, Tack Claws, Marking Awls, Carpenters' Awls, Belt Awls, Ice Awls, Carriage Jacks, Nail sets, Bush Hooks, Ice Axes, Ice Tongs, Patent Mouse Traps, Vegetable Slicers, Bit Braces, Butts and Spiral Springs, Ferrules, Hem Tryer, Ham Stringers, Oyster Knives, Cold Chisels, Handles, Solid and Prick Punches, Box Hooks, Bow Pins, Bull Ring Needles, Bull Rings, Bill Hooks, Blind Adjusters, Curling Irons (Wrought), Cork Screws, Cattle Leaders, Corn Hooks, Door Springs, Knives (Kitchen), Saw Sets (Hart's Patent), Saw Sets (Aiken's Patent), Saw Sets (Improved Bench), Spoons (Table and Tea), Washers (Tin and Iron), Knob Rings a specialty, and **Implement Screw Drivers, Hercules Reverse Action Door Spring and Retainer, Geer Air Cushion Door Spring.** Catalogues and Circulars sent on application.

J. CLARK WILSON & CO., Agents, 81 Beekman St., New York.
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N. Y. MALLET and HANDLE WORKS

Manufacturers of

Calkers', Carpenters', Stone Cutters' Tin, Copper and Boiler Makers'

MALLETS,

Hawsing Beetles, Hawsing and Calking Irons; also all kinds of Handles, Sledge, Chisel and Hammer Handles. Also

COTTON AND BALE HOOKS,
Patented Feb. 13, 1877; a new combination of Hooks.

456 E. Houston St., New York City.

SPECIALTY.

COAL WASHING MACHINES AND IMPROVED COKE OVENS.

S. DIESCHER,

Civil and Mechanical Engineer,
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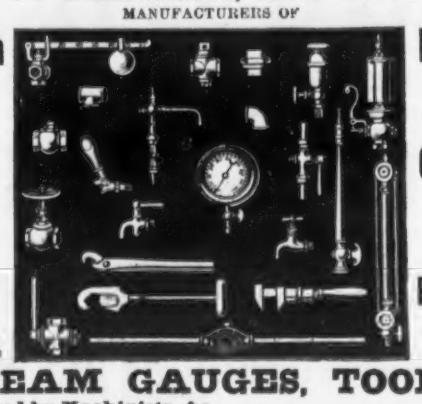
MANUFACTURERS OF

Wrought Iron **PIPE,** Cast Iron FLANGED PIPE, Cast Iron RADIATORS and BOILERS.



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STEAM GAUGES, TOOLS,

And all Supplies used by Machinists, &c.

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BOSTON, MASS., and McKEESPORT, PENN.

Wrought Iron Boiler Tubes,

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Saving of 25 per cent. dead weight, and increase of 50 per cent. in strength.

MACK'S PATENT INJECTOR, MOONEY'S PATENT VALVE.

All our Manufactures Warranted.

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Circular Plane.	Pat. March 28, 1871.
Dado Plane.	Pat. July 6, 1875.
Try Squares.	Pat. May 9, 1871. " Dec. 23, 1873. " Dec. 8, 1874.
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The VICTOR PLANES are the product of twenty-two years' experience in manufacturing Iron Planes. They are simple, durable, and in every essential practical, cheap as the cheapest, and *warranted the best.*

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The Atlantic White Lead and Linseed Oil Company,

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For STEAM, WATER and GAS.

Iron Pipe and Fittings, Plain and Galvanized.

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New Illustrated Catalogue and Price List sent by express to the Trade on application.

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MONKEY WRENCHES

8 inch Wrench, 25 CENTS.

A STRONG, DURABLE AND CONVENIENT

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meeting the demand for a Screw Wrench, combining EFFICIENCY with a COST so small as to place it in the reach of every one using such tools. It will be found particularly well adapted for the Mowing Machine, Carriage, and general Farm use, from its compactness, while its Strength and Simplicity of construction renders it quite as serviceable as a tool costing three times its price.

10 inch Wrench, 35 CENTS.

FOR CIRCULAR, ADDRESS,

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THE ANTI-FRICTION BARN DOOR HANGER.

This well-known and popular Hanger is in too general use to require any description.

It is the

Original & Only Anti-Friction Hanger

in the market.

Guaranteed to run twice as easily as any other style.

It is the ONLY ONE made without a Sheave or Wheel, and that will not mount the rail or run off the track.

Only two sizes made.

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Butchers' Cleavers,
Butchers' Choppers,
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Box Chisels and Scrapers,
Ring Bush Hooks,
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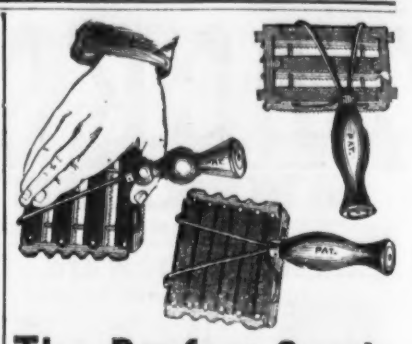
FOR SALE BY

MARTIN DOSCHER Agent, 96 Chambers Street, N. Y.



The Perfect Comb.

We call your attention specially to our new patent endless wire frame comb. The result of a long series of experiments, made with a view to meeting all the requirements of a *Perfect Comb.* It is better, stronger, and more durable than any ever before invented. The raised wire shank gives what has never before been attained, viz: a rest and brace for the thumb, in such a position that the hand cannot come in contact with the horse while using the comb. The wire braces which run from the shank over the back to the front teeth give strength and durability in a direction never heretofore attained, and at the same time serve as an extra handle; and when clasped by the fingers in connection with the raised shank the comb is more firmly, easily, and completely held, and with much less fatigue to the hand than is possible in any other formation—in short, it needs but a trial to vindicate its name: **The Perfect Comb.**

THE LAWRENCE COMB CO.

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WM. S. CARR & CO.

Sole Manufacturers of

CARR'S PATENT Water Closets,

PUMPS, CABINET WOOD WORK, &c.

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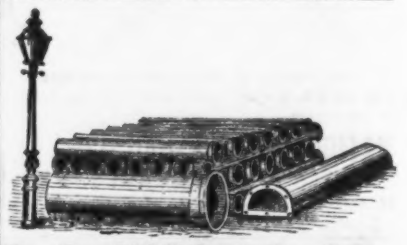

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The Iron Age Directory

and Index to Advertisements.

PAGE.

Alarm Money Drawers.
Tucker & Dorsey, Indianapolis, Ind. ... 35

Alarm Whistles and Speaking Tubes.
Ostrander W. R. 19 Ann, N. Y. ... 27

Anti-Friction Metal.
Williams E. O. & Son, Jersey City, N. J. ... 40

Anvils. *Manufacturers of.*
Fisher & Norris, Trenton, N. J. ... 35

Augers, Bits, etc. *Manufacturers of.*
Clark Wm. A., Westville, Ct. ... 37
Ghriskey Chas. M., Philadelphia ... 34
Harlow C. C. & Co., Bridgewater, Mass. ... 6
Jennings C. E. & Co., 98 Chambers, N. Y. ... 17
Pugh Job. T., Philadelphia, Pa. ... 40
The Conn. Valley Mfg. Co., Centerbrook, Conn. ... 40

Axes, Edge Tools, &c. *Manufacturers of*
D. R. Barton Tool Co., Rochester, N. Y. ... 13
Jones, M. H. & Co., Cohoes N. Y. ... 25
Ten Eyck Axe Mfg. Co., Cohoes, N. Y. ... 8

Ax Wedges.
American Sleigh and Carriage Iron Co., Boston, Mass. ... 27

Axles, Springs, etc. *Manufacturers of.*
Brown D. Arthur & Co., Fisherville, N. H. ... 40
Wood, Smith & Co., Fort Plain, N. Y. ... 12
Cleveland Axle Mfg. Co. Cleveland, O. ... 12
Cook R. & Sons, Winsted, Ct. ... 12
Spring Perch Co., Bridgeport, Conn. ... 25
Hotchkiss Guy C., Field & Co., Brooklyn, E. D. ... 36

Barn Door Hangers.
Moore S. H. & E. Y., Chicago, Ill. ... 29

Bed Screws. *Maker of.*
Shelton Co., Birmingham, Conn. ... 3

Bellows. *Manufacturers of.*
Newcomb Bro's., 586 Water, N. Y. ... 13
Scott Geo. M., Chicago, Ill. ... 13

Bells (Sleigh.)
Bevin Bros. Mfg. Co., Easthampton, Conn. ... 28

Belting, Leather. *Makers of.*
Alexander Bros., 412 N. 3d., Phila. ... 35
Arny Charles W., 148 N. 3d, Phila. ... 35
Forepaugh Wm. F., Jr., & Bros., Phila. ... 35

Belting, Rubber.
Levick Son R. & Co., Philadelphia, Pa. ... 35

Bird Cages. *Makers of.*
Lindeman O. & Co., 234 Pearl, N. Y. ... 3
Maxheimer John, 249 Pearl, N. Y. ... 13
Osborn Mfg. Co. 19 Bleecker, N. Y. ... 13

Bit Braces *Manufacturers of.*
Miller's Falls Mfg. Co., 74 Chambers, N. Y. ... 25

Black Lead.
McIlvaine Bros., Philadelphia, Pa. ... 37

Blacksmiths' Tools.
Harvey H. H., Augusta, Me. ... 38

Blind Fasts
Security Blind Fast Co., Providence, R. I. ... 27

Blind Hinges.
The Holbrook Patent Blind Hinge Mfg. Co., Watertown, N. Y. ... 6

Blocks, Tackle. *Makers of.*
Burr & Co., 31 Peck Slip N. Y. ... 36
Penfield Block Works, Lockport, N. Y. ... 13
Thompson Joseph, 36 Burling Slip, N. Y. ... 13

Blowers. *Makers of.*
Keystone Portable Forge Co., Philadelphia ... 38

Boiler Tubes.
National Tube Works Co., Boston, Mass. ... 26

Bolts (Screw.)
Eagle Bolt Works, Philadelphia, Pa. ... 12
Gilmor Wm. of Wm., Baltimore, Md. ... 12
Samuel Hall's Son & Co., 229 W. 10th, N. Y. ... 12

Borax.
Pope Thomas J. & Bro., 292 Pearl, N. Y. ... 4

Bracket Saws.
Shipman & Binder, Rochester, N. Y. ...

Brass Butts. *Makers of*
Tiebout W. J., 230 Pearl, N. Y. ... 4

Brass. *Manufacturers of.*
Ansonia Brass and Copper Co., 19 Cliff, N. Y. ... 2
Brass Goods Mfg. Co., 280 Pearl, N. Y. ... 2
Davol John & Sons, 100 John, N Y ... 2
Holmes, Booth & Haydens 49 Chambers, N. Y. ... 2
Manhattan Brass Co. 83 Reade, N. Y. ... 2
Miller Edw. & Co., 4 Warren, N. Y. ... 2
Plume & Atwood Mfg. Co., 80 Chambers, N. Y. ... 2
Scovill Mfg. Co., 421 Broome, N. Y. ... 2
The Wilmot Mfg. Co., 50 Barclay, N. Y. and 96 John, Bridgeport, Conn. ... 2
Waterbury Brass Co. 52 Beekman N. Y. ... 2

Brick Presses. *Makers of*
Carnell F. L. & D. R., 1844 Germantown Ave., Phila. ... 28

Bridge Builders.
Moseley Iron Bridge and Roof Co., 5 Dey, N. Y. ... 5
Leighton Bridge and Iron Works Rochester, N. Y. ... 25

Butcher and Shoe Knives. *Manufacturers of.*
Wilson John, Sheffield, England ... 33

Butchers' Machinery.
Forschner Chas., 41 Rivington, N. Y. ... 38

Butts and Hinges.
American Spiral Spring Butt Co 82 Beekman, N. Y. ... 40
Rick Bros., Reading, Pa. ... 33
Sabin Mfg. Co., Montpelier, Vt. ... 12
Semple & Birge Mfg. Co., St. Louis, Mo. ... 29
Union Mfg. Co., 98 Chambers, N. Y ... 7

Carriage Bolts. *Makers of.*
Townsend, Wilson & Hubbard, Phila. ... 12

Carriage Hardware. *Makers of.*
Smith H. D. & Co., Plantsville Ct. ... 18

Carriage Springs.
Roeck John H. & Co., Newark, N. J. ... 40

Car Axles.
Roberts A. & P. & Co., 265 S. 4th, Philadelphia ... 5

Car Wheels, etc. *Manufacturers of.*
Taylor Iron Works, High Bridge, N. J. ... 6

Chisels. *Manufacturers of.*
Buck Bros., Millbury, Mass. ... 13

Churns.
Chamberlin W. C., Dubuque, Iowa ...

Coal. *Miners of.*
Lehigh Valley Coal Co., cor Courtlandt and Church, N. Y. ... 33
Pardee A. & Co. 111 Broadway, N. Y. ... 33
Powel Robt. Hare & Co., Philadelphia, Pa. ... 33
The Hoboken Coal Co., Jersey City, N. J. ... 33

Coal Vases.
Sidney Shepard & Co., Buffalo, N. Y. ... 31

Coal Hods. *Manufacturers of.*
Easterbrook Wm., 311 Cherry, Phila. ... 32

Coffee and Spice Mills.
Lane Brothers, Millbrook, N. Y. ... 6
Enterprise Mfg. Co., Philadelphia, Pa. ... 34

Coil Chain.
Union Chain and Cable Co., Pittsburgh, Pa. ... 26

Coke.
Frick H. C., Pittsburgh, Pa. ... 28

Compasses and Dividers. *Manufacturers of.*
Bemis & Call Hardw. & Tool Co., Springfield, Mass. ... 12

Compound.
Towne Arthur, Boston, Mass. ... 17

Cooper's Tools, etc. *Dealers in.*
D. R. Barton Tool Co., Rochester, N. Y. ... 13
Little Chas. E. 59 Fulton N. Y. ... 8

Copper.
Pope, Cole & Co., Baltimore, Md. ... 2
The New Haven Copper Co., 255 Pearl, N. Y. ... 2

Corn Shellers.
Rumsey & Co., Seneca Falls, N. Y. ... 7

Corrugated Iron.
Moseley Iron Bridge and Roof Co., 5 Dey, N. Y. ... 5

Croquet.
R. Bliss Mfg. Co., Pawtucket, R. I. ... 12

Crucibles. *Manufacturers of.*
Wile, Si del & Co., 709 Market, Phila. ... 23

Curry Combs. *Manufacturers of.*
Cassell I. N., Fredericktown, O. ... 29
Hazleton D. W. & Co., 724 Girard Ave., Phila. ... 29
Hotchkiss' Sons, Bridgeport, Conn ... 29
Kellogg Wm. P. & Co, Troy, N. Y. ... 12
Lawrence Curry Comb Co., 382 3d Avenue, N. Y. ... 26

Cutlery. *Importers of.*
Boker Hermann & Co., 101 Duane, N. Y. ... 33
Clatworthy F. & W., 82 Chambers, N. Y. ... 11
Fisher Jos. S., 411 Commerce, Phila. ... 11
Friedmann & Lauterjung, 14 Warren, N. Y. ... 11
King, Briggs & Co., 80 Chambers, N. Y. ... 11
Meriden Cutlery Co., 49 Chambers, N. Y. ... 11

Cutlery. *Manufacturers of.*
American Shear Co., Hotchkissville, Conn. ... 11
Burkinshaw Aaron, Pepperell, Mass. ... 11
Burkinshaw W. C., 26 Cliff, N. Y. ...
John Russell Cutlery Co., 97 Chambers, N. Y. ... 40
Miller Bros. Cutlery Co., W. Meriden, Conn. ... 11
Naugatuck Cutlery Co., 89 Chambers, N. Y. ... 11
New York Knife Co., Walden, N. Y. ... 11
Owen & Campbell, 220 N. Second, Phila. ... 11
The Frary Cutlery Co., Bridgeport, Conn. ... 11
The Lamson & Goodnow Mfg. Co., 89 Chambers, N. Y. ... 11
The Rogers Cutlery Co., Hartford, Conn. ... 11

Door and Gate Springs.
Dunne P. R. & Co., 182 Fulton, N. Y. ... 17
Quackenbush, Townsend & Co., 59 Reade, N. Y. ... 34
Van Wagoner & Williams, 82 Beekman, N. Y. ... 40

Dredging, *and Makers of Dredging Machines.*
Am. Dredging Co., 10 S. Delaware ave., Phila. ... 39

Drill Chucks. *Manufacturers of.*
Cushman A. F., Hartford, Conn. ...
Frasse & Co., 62 Chatham, N. Y. ... 36
Lambertville Iron Works, Lambertville, N. J. ... 35

Drilling Machines. *Makers of.*
Fox Alfred & Co., Philadelphia. ... 44
Silver & Deming Mfg. Co., Salem, O. ... 44
Thorne, DeHaven, & Co., Philadelphia ... 44

Drills.
Penna. Diamond Drill Co., Pottsville, Pa. ... 11

Drop Forgings.
Boker Hermann & Co., 101 and 103 Duane, N. Y. ... 20
Hull & Belden Co., Danbury, Conn. ... 17

Edge Tools. *Makers of.*
The D. R. Barton Tool Co., Rochester, N. Y. ... 13
Doscher M., 4 and 6 Gold, N. Y. ... 26

Electro-Plating.
Ernhout & Catlin, 43 Gold, N. Y. ... 27

Elevating and Conveying Machines.
Fitzhugh J. R., 4228 Market, Phila. ... 28

Elevators. *Makers of.*
Crane Bros. Mfg. Co., Chicago, Ill. ... 9
Lane & Bodley Co., Cincinnati, O. ... 36

Elevator Buckets.
The Rivet Bucket Co., 34 Franklin, Chicago, Ill. ... 27

Emery Wheels.
L. V. E. W. Co., Weissport, Pa. ... 40

Enameled Plates.
Lefferts Enamel Works, 417 W. 24, N. Y. ... 32

Engineers, Machinists, etc.
Henshall James, 1056 Beach, Phila ... 38
Moore James, cor. 16th and Buttonwood, Phila. ... 39

Engines, Steam. *Makers of.*
Austin J. & Co., 115 Liberty, N. Y. ... 36
Ervien Chas. W. & Co., Kensington, Phila. ... 36
Fales Thomas J., 18 Park Place, N. Y. ...
Fitchburg Steam Engine Co., Fitchburg, Mass. ... 39
Hartford Foundry and Machine Co., Hartford Ct. ... 39
Lovegrove & Co., 125 South 4th, Phila. ... 6
Payne B. W. & Sons, Corning, N. Y. ... 28
Shapley & Wells, Binghamton, N. Y. ... 39
Snyder Ward B., 94 Fulton, N. Y. ... 38

Engravers.
Collins, Geo. B. 10 Warren, N. Y. ... 28

Faucets, Brass. *Makers of.*
McNab & Harlin Mfg. Co., 56 John, N. Y. ... 26

Faucets, *Self-Measuring. Makers of.*
Enterprise Mfg. Co., of Pa., Phila, and N. Y. ... 34

Feed Cutters.
Silver & Deming Mfg. Co., Salem, O. ... 38

Files, *Importers of.*
Carr J. & Riley 82 John, N. Y. ... 32
Fisher Joseph S., 411 Commerce, Phila. ... 11
Frasse Peter A. & Co. 95 Fulton, N. Y. ... 8
Moss F. W., 80 John, N. Y. ... 32
Sanderson Bros. & Co., 16 Cliff, N. Y. ... 32

Files, *Manufacturers of.*
Adamantine File Works, Providence, R. I. ... 18
American File Co., Pawtucket, R. I. ... 8
Auburn File Works, 89 Chambers, N. Y. ... 8
Barnett G. & H. 41 and 43 Richmond, Phila. ... 8
Disston Henry & Sons, Phila. ...
Draper C. T. & Co., Sing Sing, N. Y. ... 8
Everhart James M., Scranton, Pa. ... 40
Heller & Bros., Newark, N J ... 8
Johnson & Bro., 1 Commercial, Newark, N. J. ... 8
Jowitt Thos. & Sons, Sheffield. ... 8
McCaffrey & Bro., 1732 and 1734 N. 4th, Phila. ... 8
Nicholson File Co., Providence, R. I. ... 28
Paul Chas. B., Williamsburgh, N. Y. ... 8
Rothery John & Wm., Matteawan, N. Y. ... 8

Fire Brick. *Makers of.*
Brooklyn Clay Retort and Fire Brick Works, Van Dyke, St., Brooklyn N. Y. ... 28
Evens & Howard, St. Louis, Mo. ...
Gardner, Stuart & Co., Pittsburgh ... 28
Hall A. & Sons, Perth Amboy, N. J. ... 28
Hall A. & Sons, Buffalo, N. Y. ... 28
Maurer Henry, 418 East 23d, N. Y. ... 28
Kreischer B. & Son, 58 Goerck, N. Y. ... 28
Newton & Co., Albany, N. Y. ... 28
Ostrander James & Son, Troy, N. Y. ... 28
Valentine M. D. & Bro., Woodbridge, N. J. ... 28
Watson John R. Perth Amboy, N. J. ... 28
Weber Adam, 683 E. 15th, N. Y. ... 28

Fire Escapes.
Falk L., 165th, N. Y. ... 18

Fishing Tackle.
Shipley A. B. & Son, Philadelphia ... 8

Flint and Emery Paper and Cloth.
Baeder, Adamson & Co. 730 Market, Phila. ... 17

Fluting Machines.
Sauerbier's Sons, H., Newark, N. J. ... 38
The American Machine Co., Philadelphia ... 18
Weeks A. A., 82 John, N. Y. ... 24

Forges, Portable, etc.
Keystone Portable Forge Co., Philadelphia ... 38

Founders and Machinists.
Saml. J. Cresswell Jr., 812 Race, Phila., Pa ... 6

Foundry Facings.
Paxson J. W. & Co., 514 Beach, Phila. ...
Whitehead Bros., 517 W. 15th, N. Y. ... 4

Furnaces. *Makers of*
Richmond & Potts, 119 S. Fourth, Phila., Pa. ... 5

Galvanized Iron.
Lefferts Marshall Jr., 90 Beekman, N. Y. ... 4

Glass Signs.
Otto Steitz, N. Y. Glass Letter Co., 611 B'way, N. Y. ... 25

Governors.
Junius Judson & Son, Rochester, N. Y. ... 38

Grain Cradles and Snaths.
Semple & Birge Mfg. Co., St. Louis, Mo. ... 29

Grindstones.
Wood Walter R., 283 and 285 Front, N. Y ... 33
Worthington & Sons, North Amherst, O. ... 35

Guns, &c.
Moore's John P. Sons, 300 Broadway, N. Y. ... 6
Windmuller Louis & Roelker, 20 Reade N. Y. ... 20

Gunpowder. *Makers of.*
Kneeland F. L. (Dupont) 70 Wall, N. Y. ... 32
Laflin & Rand Powder Co. 26 Murray, N. Y. ... 32

Hammers, etc. *Manufacturers of.*
Harvey H. H., Augusta, Me. ... 38

Handles. *Makers of*
N. Carolina Handle Co., 79 Reade, N. Y. ... 34
Semple & Birge Mfg. Co., St. Louis, Mo. ... 29

Hardware Commission Merchants.
Biglin Philip S., 110 Chambers, N. Y. ... 6
Graham & Haines, 113 Chambers, N. Y. ... 34
Heaton & Denckla, Philadelphia, Pa. ... 29
Walbridge G. B. & Co., 83 Reade, N. Y. ... 31

Hardware Dealers.
Barker W. C. & Co., Chicago. ... 12
Lloyd, Supplee & Walton, 625 Market, Phila. ... 34
Prouty Hardware & Mfg. Co., 59 Beekman, N. Y. ... 40
Quackenbush, Townsend & Co., 59 Reade, N. Y. ... 34
Shepard Sidney & Co., Buffalo N. Y. ... 31

Hardware Importers.
Boker Hermann & Co., 101 Duane, N. Y. ... 33
King, Briggs & Co., 80 Chambers, N. Y. ... 11
Van Wart, Son & Co., 134 and 136 Duane, N. Y. ... 11
Harrold F. W., 78 Chambers, N. Y. ... 11
Windmuller Louis & Roelker 20 Reade N. Y. ... 20

Hardware Manufacturers.
American Spiral Spring Butt Co., 82 Beekman, N. Y. ... 40
Blake Bros. Hardware Co., New Haven, Conn. ... 33
Clark & Co. Buffalo, N. Y. ... 31
Corbin P. & F., New Britain, Conn. ...
Cowles Hardware Co., Unionville, Ct. ... 25
Enterprise Mfg. Co., Phila. ... 34
Miller's Falls Mfg. Co., 74 Chambers, N. Y. ... 25
Peck G. Webster, 110 Chambers, N. Y. ... 8
Perin & Gaff Mfg. Co., Cincinnati, O. ... 7
Pratt & Co., Buffalo, N. Y. ... 31
Providence Tool Co., Providence, R. I. ... 13
Russell & Erwin Mfg. Co., New York. ... 10
Union Mfg. Co. 99 Chambers, N. Y. ... 7
Van Wagoner & Williams 82 Beekman, N. Y. ... 40
Wilson Mfg. Co., New London, Conn. ... 6

Hardware Specialties.
Grant & Co., Newark, N. J. ... 34
Jessup & Sterling, 7 and 9 Cliff, N. Y. ... 4
Perin & Gaff Mfg. Co., Cincinnati, O. ... 6
Semple & Birge Mfg. Co., St. Louis, Mo. ... 29
Shepard Sidney & Co., Buffalo, N. Y. ... 31
Spencer & Underhill, 94 Chambers, N. Y. ... 4

Hinges.
Lewis, Oliver & Phillips, Pittsburgh, Pa. ... 13

Hoisting Engines. *Makers of.*
Crane Bros. Mfg. Co., Chicago, Ill. ... 9
Mundy J. S., Newark, N. J. ... 38

Horse Nails. *Makers of*
Ausable Horse Nail Co. 35 Chambers, N. Y. ... 8
Globe Nail Co., Boston, Mass. ... 33
National Horse Nail Co., Vergennes, Vt ... 25
Northwestern Horse Nail Co., Chicago, Ill. ... 33
Piatt & Co., Buffalo, N. Y. ... 31
Putnam S. S. & Co., Neponset, Mass. ... 6
The Fowler Nail Co., Seymour, Conn. ... 33

Horse Shoes. *Makers of.*
Boston Rolling Mills, 17 Batterymarch, Boston. ... 4
Burden Iron Works, Troy, N. Y. ... 4
Rhode Island Horse Shoe Co., Providence, R. I. ... 18
Schoenberger & Co., Pittsburgh, Pa. ... 4

Hydrants.
Davis John T., Washington, D. C. ... 32

Hydraulic Jacks.
Dudgeon Richard, 24 Columbia, N. Y. ... 39
Lyon E. & Co., 470 Grand, N. Y ... 39

Insurance, Boiler.
Hartford Steam Boiler Inspection and Insurance Co. ... 39

Iron Brokers.
Boynton Geo. A., 70 Wall, N. Y. ... 4
Crane U. O., 104 John, N. Y. ... 4
Hatry A. G., Pittsburgh, Pa. ... 4
Hazard T. D 204 Pearl, N. Y. ... 4

Iron Bridges.
Leighton Bridge and Iron Works, Rochester, N. Y. ... 25

Iron (Castings.)
Spencer's Sons, I. S., Guilford, Conn. ... 2

Iron, Charcoal, *Warm or Cold Blast.*
Quincy John W., 98 William, N. Y. ... 4

Iron Commission Merchants.
Adams Hugh W., 56 Pine, N. Y. ...
Brown T. Horace, 205½ Walnut, Phila. ... 5
Lowe S. B., Chattanooga, Tenn. ... 5
Spooner & Collins, St. Louis, Mo. ... 4

Iron, Pig, *Importers of.*
Williamson James & Co., 69 Wall, N. Y. ... 4

Iron Dealers.
Abeel Brothers, 190 South, N. Y. ... 4
Bonnell, Botsford & Co., Youngstown, O. ... 4
Borden & Lovell, 70 and 71 West, N. Y. ... 4
Cooney Daniel F., 88 Washington, N. Y. ... 4
Huerstel G., 99 Market Slip, N. Y. ... 4
Fuller, Lord & Co., 139 Greenwich, N. Y. ... 4
Harrison & Gilloon, 558 to 562 Water, N. Y. ... 4
Jackson & Chase, 206 and 208 Franklin, N. Y. ... 4
Judson B. F., 457 and 459 Water, N. Y. ... 4
Moore Geo. S. & Co., Louisville, Ky. ... 4
Ogden Wallace, 85, 87, 89 and 91 Elm, N. Y ... 4
Pierson & Co., 24 Broadway, N. Y. ... 4
Quincy John W., 98 William, N. Y. ... 4
Randall & Jones (Taylor Iron), 10 Oliver, Boston, Mass. ... 4
Reed John H. & Co. ... 6
Richards D. W. & Co., 92 Mangin St., N. Y. ... 4
Wallace Wm. H. & Co., Albany and Washington streets, N. Y. ... 4
Warner A. B. & Sons, 28 and 29 West, N. Y. ... 4
Williamson James & Co., 69 Wall, N. Y. ... 4
Whitney A. R. & Bro., 58 Hudson N. Y. ... 4

Iron, *Manufacturers of.*
Barker W. C. & Co., Chicago. ... 12
Boston Rolling Mills, 17 Batterymarch, Boston. ... 4
Bradley, Reis & Co., 22 Cliff, N. Y. ... 4
Burden Iron Works, Troy, N. Y. ... 4
Cleveland Rolling Mill Co., Cleveland, O. ... 6
Everson, Macrum & Co., Pittsburgh, Pa. ... 4
J. & J. Rogers Iron Co., Ausable Forks, N. Y. ... 4
Leonard John, 460 & 461 West st. N. Y. ... 4
Oxford Iron Co., 81 Washington, N. Y. ... 4
Phillips, Nimick & Co., Pittsburgh, Pa. ... 40
Phoenix Iron Co., 410 Walnut, Phila. ... 5
Prosser Thos. & Son, 15 Gold, N. Y. ... 4
Rowland James & Co., 920 N. Delaware, Phila. ... 5
Rowland Wm. & Harvey, Phila. ... 40
Shoenberger & Co., Pittsburgh, Pa. ... 4
Susquehanna Iron Co., Columbia, Lancaster Co. Pa. ... 5
The Passaic Rolling Mill Co., Paterson, N. J. ... 4
Zug & Co., Pittsburgh, Pa. ... 4

Iron, Planished Sheet *Manufacturers of*
Wood W. D. & Co., Pittsburgh, Pa. ... 5

Iron Pipe. (Tin Lined.)
Tatham & Bros., 82 Beekman, N. Y. ... 3

Iron Railings, etc.
Nellis A. J. & Co., Pittsburgh ... 5

Iron, Swedish. *Importers of.*
Mitander Nils, 69 William, N. Y. ... 4

Ironware (Granite.)
St. Louis Stamping Co., St. Louis, Mo. ...

Japanese Paper Ware.
Jennings Bros., 352 Pearl, N. Y. ... 25

Japans (Copal.)
Moller & Schumann, Marcy & Flushing Avenues, Brooklyn, N. Y. ... 35

Lanterns, *Manufacturers of.*
Dietz R. E., (Tubular) 54 and 56 Fulton, N. Y. ... 40
Howard & Morse 45 Fulton, N. Y. ... 2

Lathes.
Johnson, Jr. Israel H. & Co., Philadelphia ... 36

Lead Pipe, &c., *Manufacturers of.*
Bayley, Farrell & Co., Pittsburgh, Pa. ... 2

Levels.
Disston Henry & Sons, Phila. ...

Locks. *Manufacturers of*
Baldwin Lock Co., Tioga, Pa. ...
Bohannan Wilson, Broadway and Kossuth, Brooklyn, E. D ... 3
Romer & Co., Newark, N. J. ... 3
Union Nut Co., 78 Beekman, N. Y. ... 34
United States Lock Co., Kingston, Mass. ... 3
Yale Lock Mfg. Co., 298 Broadway, N. Y. ... 3

Machinery. *Makers of.*
Bliss & Williams, 167 Plymouth, Brooklyn ... 39
Pittsburgh Mfg. Co., Pittsburgh, Pa. ... 39
Pratt & Whitney Co., Hartford, Conn. ... 38
Sellers Wm. & Co., 1600 Hamilton Phila ... 39
Teal, C. A. & W. L., 4116 Ludlow, Phila., Pa. ... 36
The Bullard Machine Co., 14 Dey, N. Y. ... 20
Wetherill Robert & Co. Chester, Pa. ... 38

Machine Screws. *Makers of.*
Lyon & Fellows Mfg. Co., Williamsburg, N. Y. ... 12

Machinists' Tools. *Makers of.*
Blaisdell P. & Co., Worcester Mass. ... 38

Machinists.
Leng & Ogden, 212 Pearl, N. Y. ... 28
Kellogg Wm. P. & Co., Troy, N. Y. ... 12

Malleable Iron Castings. *Maker of.*
Hammer & Co., Branford, Ct. ... 38
Meeker D. M. & Son, Newark, N. J. ... 37

Malleable Iron Sash.
Meeker D. M. & Son, Newark, N. J. ... 37

Measuring Tapes.
Eddy Geo. M. & Co., 353 Classon Ave., Brooklyn, N. Y. ... 6

Mallets.
N. Y. Handle & Mallet Works, 456 E. Houston ... 25

Manganese.
Pyrolusite Manganese Co., 214 Pearl, N. Y. ... 32

Mangles.
Standard Laundry Mach. Co., Boston & New York ... 32

Meat Chopping Machinery.
Murray Iron Works, Burlington, Iowa. ... 36

Metal Dealers and Brokers.
Crane U. O., 104 John, N. Y ... 4
Dickerson, Van Dusen & Co. 29 & 31 Cliff, N. Y. ... 2
Gregg H. L. Co. 108 Walnut, Phila. ... 5
Phelps, Dodge & Co., Cliff, bet. John & Fulton, N. Y ... 2
Purves A. & Son, cor. South and Penn, Phila. ... 5
Quincy J. W., 98 William, N. Y. ... 27
Sellew R. & Co., St. Louis Mo. ... 2

Metallurgists.
Britton J. Blodgett 339 Walnut Phila. ... 6

Metals Perforated.
Hayes G., 71 8th ave. ... 2

Metal Roofing.
Brass Goods Mfg. Co., 280 Pearl N. Y. ... 28

Miners' Candles. *Makers of*
James Boyd's Sons, 10 and 12 Franklin, N. Y. ... 38

Models.
Lennox & Paine, Cleveland, O. ... 8

Molding Machines.
Hammer T. F., Branford, Conn. ... 38

Mouse Traps, Catchemalive, *Makers of.*
Dietz R. E., 54 and 56 Fulton, N. Y. ... 40

Mowing Machine Knife Grinder.
Fisher Henry, Canton, O. ... 32

Nails
The American Wire Nail Co., Covington, Ky ... 17
Schoenberger & Co., Pittsburgh, Pa. ... 4
Zug & Co. Pittsburgh, Pa. ... 4

Nail Machinery.
Coyne & Hatry, Pittsburgh, Pa ... 4

Nail Pullers.
Maltby, Curtiss & Co., 34 Reade, N. Y. ... 6

Nickel Platers.
Carter Edward, Troy, N. Y. ... 27
Colt A. T., 47 Beekman, N. Y. ... 27
Condit, Hanson & Van Winkle, Newark, N. J. ... 27
Hartman John, 37½ N. Seventh, Philadelphia ... 27
Manhattan Nickel Works, 180 and 182 Center, N. Y. ... 27
Menahan J., Franklin, opposite tombs, N. Y. ... 27
Owen S. S. & Co., 121 E. 13, N. Y. ... 27

Norway Shapes, *Rollers of.*
Rowland Wm. & Harvey, Frankford, Phila. ... 40

Note Broker.
Gallaudet P. W 3 and 5 Wall, N. Y. ... 4

Nuts, Bolts, etc. *Makers of.*
Clark Bros. & Co., Milldale, Conn ... 12
Fuller, Lord & Co., 139 Greenwich, N. Y. ... 4
Haskell W. H. & Co., Pawtucket, R. I. ... 13
Lewis, Oliver & Phillips, Pittsburgh, Pa. ... 13
Russell, Birdsall & Ward, Port Chester, N. Y. ... 40
Shelton Co., Birmingham, Conn. ... 3
Sternbergh J. H., Reading, Pa. ... 40
Union Nut Co., 78 Beekman N. Y. ... 34

Oil Cook Stoves.
C. Reissner & Co., 242 Pearl, N. Y. ... 13

Oil Lubricating. *Makers of*
Lester Oil Co., 81 Maiden Lane, N. Y. ... 28

Old Iron, etc.
Gregg H. L. & Co., 108 Walnut, Philadelphia ... 5

Ore Crushers.
Blake Crusher Co., New Haven Ct. ... 38

Packing (Steam).
Symonds & Co., Philadelphia ... 18

Paint (Iron).
Pittsburgh Iron Paint Co., Pittsburgh, Pa. ... 28

Paints and Oils. *Dealers in.*
Devoe F. W. & Co., 117 Fulton, N. Y. ...

Pans. (Dripping and Bread.)
Lewis, Dalzell & Co., Pittsburgh, Pa. ... 3

Patent Solicitors.
Howson & Son, Phila. and Washington, D. C. ... 38
Spencer A. H., 28 State, Boston, Mass. ...

Pattern Maker.
Reger W. R., Philadelphia. ... 35

Picks, *Makers of*
Pierson & Co., 24 Broadway, N. Y. ... 4

Pipes, Fittings, etc., *Makers of.*
Eaton, Cole & Burnham Co., 58 John, N. Y. ... 26
McNab & Harlin Mfg. Co., 56 John, N. Y. ... 26
Pancoast & Maule, 227 Pear, Phila. ... 26

Pipe, Water and Gas. *Makers of.*
Leighton Bridge and Iron Works, Rochester, N. Y. ... 25
McNeal & Archer, Burlington, N. J. ... 6
Wood R. D. & Co., 400 Chesnut, Phila. ... 26

Plane Irons, *Manufacturer of*
Buck Bros., Millbury, Mass. ... 13
D. R. Barton Tool Co., Rochester, N. Y. ... 13

Planes. *Manufacturers of*
D. R. Barton Tool Co., Rochester, N. Y. ... 13
Stanley Rule & Level Co., 35 Chambers, N. Y. ... 9

Plated Ware
Derby Silver Co., Derby, Ct. ... 40
Hall, Elton & Co., 75 Chambers, N. Y. ... 11

Plows, Chilled Iron. *Makers of.*
South Bend Iron Works, South Bend Ind. ... 37

Plumbers' Materials, *Manufacturers of*
Everhart Jas. M., Scranton, Pa ... 40
Carr Wm. S. & Co. 106 Centre, N. Y. ... 26

Potato Masher.
Crane Robert Jr., Columbia, Pa. ... 11

Presses, Power, *Makers of.*
Bliss & Williams, 167 Plymouth, Brooklyn ... 39
Merriman A. H., West Meriden, Ct. ... 38
The Stiles & Parker Press Co., Middletown, Ct. ... 39

Pressure Blowers. *Makers of.*
Keystone Portable Forge Co., Philadelphia ... 38

Pulleys, Friction.
Penfield Block Works, Lockport, N. Y. ... 13
Thompson Joseph, 38 Burling Slip ... 8

Pumping Engines, (Hot Air) *Makers of*
Rider, Wooster & Co., Walden, Orange Co., N. Y. ... 26

Pumps. *Makers of.*
Douglas W. & B., Middletown Conn. ... 7
Kilvert & Tappen Boston, Mass. ... 36
Nason Mfg. Co., 71 Fulton, N. Y. ... 7
Rider, Wooster & Co., Walden, Orange Co., N. Y. ... 26
Rumsey & Co., Seneca Falls, N. Y. ... 7
Union Mfg. Co., 98 Chambers, N. Y. ... 7

Pyrometers.
Brown Edward, 311 Walnut, Phila. ... 32

Railroad Supplies.
Jackson & Tyler Baltimore, Md. ... 28
Rogers H. A., 19 John, N. Y. ... 9

Rails, Iron or Steel, *Makers of.*
Atkins Bros., Pottsville, Pa. ... 6
Cambria Iron Co., Johnstown, Pa. ... 5
Cleveland Rolling Mill Co., Cleveland, O. ... 6
The Edgar Thomson Steel Co., 57 Broadway, N. Y. ... 33
Wood & Leman, 35 Wall, N. Y. ... 4

Razor Straps, *Makers of.*
B. F. Badger & Son Charlestown, Mass. ... 8

Refrigerators.
Law William, 709 & 711 Third Ave., N. Y. ... 18

Rivets.
Gilmor Wm. of Wm., Baltimore, Md. ... 12
Townsend W. P. & Co., Pittsburgh, Pa. ... 4

Rock Drills.
Weaver W., Phoenixville, Pa. ... 17

Road Rollers.
Pioneer Iron Works, 149 William, Brooklyn, N. Y. ... 37

Road Scrapers, &c.
Semple & Birge Mfg. Co., St. Louis, Mo. ... 29

Rolling Mill Machinery, etc., *Manufacturers of.*
Moore James, Cor 16th and Buttonwood, Phila. ... 39

Rotary Shears.
Newbold R. S. & Son, Norristown, Pa. ... 35

Rules. *Manufacturers of.*
Stanley Rule and Level Co., 35 Chambers St. ... 9
Stephens & Co., Riverton, Conn. ... 17

Saddlers' Tools.
Osborne C. S. & Co., Newark, N. J. ... 39

Sand and Emery Paper. *Makers of*
Baeder, Adamson & Co., 730 Market, Phila. ... 17

Sad Irons.
Chalfant Mfg. Co., Philadelphia, Pa. ... 34

Sash Fasteners.
Babcock C. P., Portland, Me. ... 7

Sash Holder.
Steller C. E., Milwaukee, Wis. ... 34

Saws. *Makers of.*
American Saw Co., Trenton, N. J. ... 29
Atkins E. C. & Co., Indianapolis, Ind. ... 29
Boynton E. M., 80 Beekman, N. Y. ... 29
Disston Henry & Sons, Phila. ...
Peace & Hogan, Williamsburg, N. Y. ... 29
Wheeler, Madden & Clemson Mfg. Co., Middletown, N. Y. ... 29

Saw Frames, Wood, *Makers of.*
Peace Harvey W. Williamsburg, N. Y. ... 29

Scales. *Manufacturers of.*
Brandon Mfg. Co., Brandon, Vt. ... 34
Chattillon John & Sons, 91 Cliff, N. Y. ... 9
Riehle Bros., 9th above Master, Phila. ... 26
Southwark Hardware Co., Philadelphia ... 17

Screws. *Makers of.*
American Screw Co., Providence, R. I. ... 16
Billerback J. & Co., cor. 17th and Venango, Phila. ... 12
Miles F. S., 205 Quarry, Phila. ... 12
Russell & Erwin Mfg. Co., New York ... 10
The Chicago Screw Co., Chicago, Ill ... 12

Screws, *Importers of.*
Bruce Geo. W., 1 Platt, N. Y. ... 6

Screw Drivers, *(Improved) Makers of.*
Disston Henry & Sons, Phila. ...

Scroll Saws.
Trump Bros., Wilmington, Del. ... 3

Scythe Stones.
Dishman F. E., New Albany, Ind. ... 33
Pike A. F., East Haverhill, N. H. ... 33

Shafting.
Wood Thomas, Philadelphia ... 37

Shovels, &c.
Hussey, Binns & Co., Pittsburgh, Pa. ... 37
Iron Clad Can Co., 23 Cliff, N. Y. ... 40
Middleboro Shovel Co., 63 Oliver, Boston ... 37
Old Colony Iron Co., Taunton, Mass. ... 37
Remington E. & Sons, 57 Reade, N. Y. ... 37

Shot, etc.
Sparks Thos. W., 121 Walnut, Philadelphia ... 7

Shears Scissors &c.
Marx Bros., 439 B'way, N. Y ... 11

Shears (Sheep).
Hildick A. H. & Co., 12 Warren, N. Y. ... 11

Shutter Knobs.
Weaver Geo. E., Providence, R. I. ... 29

Sieves (Metallic).
Dayton Geo. E., Chicago ... 34

Skates.
Florence Machine Co., Florence, Mass. ... 36

Sleighs.
Crosby, Gilzinger & Co., Rondout, N. Y ... 29

Smelting Works.
Du-Plaine & Co., 1303 & 1305 Buttonwood, Phila. ... 40
Hooks Smelting Co., Phila., Pa. ... 2
Reeves Paul S., 760 South Broad St. Phila. ... 40

Snaps.
Hold Back & Snap Co., Troy, N. Y. ... 28

Spelter.
Manning & Squier, 113 Liberty N. Y. ... 2

Spring Door Sheaves.
Shannon J. B., Philadelphia ... 12

Springs.
Rowland Wm. & Harvey, Frankford, Phila. ... 40

Stamped and Japanned Tin Ware.
Shepard Sidney & Co., Buffalo, N. Y. ... 31
The Chicago Stamping Co., Chicago, Ill. ... 3

Stave Jointer.
Crossley H. A., Cleveland, O. ... 24

Steam Hammers, etc., *Makers of.*
Bradley Mfg. Co., Syracuse, N. Y. ... 36
Dudgeon Richard, 24 Columbia, N. Y. ... 39

Steam Pumps, etc., *Manufacturers of*
Carr A., 43 Cortland, N. Y ... 26
Clayton Jas., 11 Water, Brooklyn, N. Y. ... 3
Crane Bros. Mfg. Co. Chicago, Ill. ... 28
Knowles Steam Pump Works, Warren, Mass. ... 34
McGowan John H. & Co., Cincinnati, O ... 39
Valley Machine Co., East Hampton, Mass. ... 39

Steam Traps
Albany Steam Trap Co., Albany, N. Y. ... 38
Jones A. L., Philadelphia. ... 32

Steel Castings. *Manufacturers of*
Bidwell J. C., Pittsburgh, Pa. ... 40
Chester Castings Co., Evelina, Phila Pa. ... 40
Flagg Stanley G. & Co., 216 & 218 N. 3rd, Phila. ... 40
Pittsburgh Steel Casting Co., Pittsburgh, Pa. ... 40

Steel Importers.
Carr J. & Riley, 82 John, N. Y. ... 32
Sulzbacher, Hyman, Wolff & Co., 86 Cliff, N. Y. ... 32
Hobson Francis & Son, 97 John, N. Y. ... 32
Jonas, Meyer & Colver, Hartford, Conn. ... 32
Moss F. W., 80 John, N. Y. ... 32
Piersons & Co. 24 Broadway, N. Y. ... 4
Sanderson Geo. & Co., 57 John, N. Y. ... 33
Van Wart, Son & Co., 134 and 136 Duane, N. Y. ... 11

Steel (Mushet Special).
Randall & Jones, 10 Oliver, Boston, Mass ... 32

Steel Manufacturers.
Bradford & Anthony, Boston, Mass. ... 12
Chrome Steel Co., Brooklyn, E. D. ... 33
Cleveland Rolling Mill Co., Cleveland, O. ... 6
Midvale Steel Works, Nicetown, Phila., Pa. ... 32
Miller, Metcalf & Parkin, Pittsburgh. ... 32
Nicholson John & Sons, Sheffield, England ... 32
Rowland Wm. & Harvey, Frankford Phila. ... 40
Smith, Sutton & Co., Pittsburgh, Pa. ... 32
Singer, Nimick & Co., Pittsburgh. ... 3
Sweet's Mfg. Co., Syracuse, N. Y ... 32
The Edgar Thomson Steel Co., 57 Broadway, N. Y. ... 33
Wardlow S. & C., Sheffield, England ... 32

Steel Name Stamps.
New York Stencil Works, 87 Nassau, N. Y. ... 24

Steel Shutters.
Clark & Co.'s 162 & 164 W. 27th, N. Y. ... 9

Steel Spiral Springs. *Manufacturers of*
Chatillon & Sons, 91 and 93 Cliff, N. Y. ... 9

Stocks and Dies.
Holroyd & Co., Waterford, N. Y. ... 36

Stokers.
Smith Dillwyn, 18 S. 6th, Philadelphia ... 18

Stone Crushing Machines.
Blake Crusher Co., New Haven, Ct. ... 38

Stone Ironware.
Metal Mfg. Co., St. Louis, Mo. ... 3

Stove Boards. *Manufacturers of*
Ansonia Brass and Copper Co., 19 and 21 Cliff, N. Y. ... 9
Shepard Sidney & Co., Buffalo N. Y. ... 31

Stove Ornaments.
Troy Polishing Works, 641 River, Troy, N. Y. ... 38

Tacks.
American Tack Co., Fairhaven, Mass. ... 25
Brigham, Litchfield & Vining, S. Abington, Mass. ... 8
Field A. & Sons, Taunton, Mass. ... 9
Grundy Geo. C., 165 Greenwich, N. Y. ... 24
Shelton Co., Birmingham, Ct. ... 7

Taps and Dies.
Manning H. S. & Co., 111 Liberty, N. Y. ... 6

Tin Plate.
N. & G. Taylor Co., Philadelphia ... 18

Try Squares, Bevels &c. *Makers of*
Bailey Leonard & Co., Hartford, Ct. ... 26
Disston Henry & Sons, Phila. ...

Tube Brushes.
Haurey Henry F., Newark, N. J. ... 3

Tube Expanders.
Dudgeon Richard, 24 Columbia, N. Y. ... 39

Twist Drills, *Makers of.*
Morse Twist Drill & Mach. Co., N. Bedford, Mass. ... 37

Tuyere Irons.
Harkins Thomas B., Bristol, Pa. ... 17

Valves, Gas, Water and Steam.
Junius Judson & Son, Rochester, N. Y. ... 39
Peet Valve Co., Boston, Mass. ... 26
Ludlow Valve Mfg. Co., Troy, N. Y. ... 39
Mohawk and Hudson Mfg. Co., Waterford, N. Y. ... 30

Varnishes
Moller & Schumann, Marcy & Flushing Avenues, Brooklyn, N. Y. ... 35

Vises.
Millers Falls Co., 74 Chambers, N. Y. ... 25
Fisher & Norris Trenton, N. J. ... 35
Howard Iron Works, Buffalo, N. Y. ... 25
Trenton Vise & Tool Works, 101 & 103 Duane, N. Y. ... 6
Wilson Mfg. Co., New London, Conn. ... 12

Wagon and Carriage Materials.
Barker W. C. & Co., Chicago. ... 12
Knowles W. W., Mt. Carmel, Ct. ...
Moon C. R. & Co., Cleveland, O. ... 12

Washing Machines.
Diescher S., Pittsburgh, Pa. ... 25
Metropolitan Washing Machine Co., 32 Cortlandt N. Y. ... 29

Waste Heat Utilizer and Ventilator.
Silver L. B., Cleveland, O. ... 9

Water Wheels (Turbine).
Alcott F. C. & Son, Mount Holly, N. Y. ... 6

Weather Vanes.
Baldwin V. W., 213 Pearl, N. Y. ... 17

Weighing Machines.
Robt. King, 246 Plymouth, Brooklyn, N. Y. ... 37

Wheelbarrows
Semple, Birge & Co., St. Louis, Mo. ... 29

White Lead. *Manufacturers of*
Brooklyn White Lead Co., 89 Maiden Lane, N. Y. ... 26
Colgate Robert & Co., 287 Pearl, N. Y. ... 26
Jewett John & Sons 182 Front, N. Y. ... 26
Lewis John T. & Bros., 231 S. Front, Phila., Pa. ... 26
Wetherill & Bro., 31st. below Chestnut, Phila. ... 26

Window Springs. *Makers of*
Hammond W. S., Lewisberry, Pa. ...

Window Springs (Worthup's Patent).
Security Blind Fast Co., Providence, R. I. ... 27

Wire. *Manufacturers of.*
Cary & Moen, 234 W. 29th, N. Y. ... 2
Gilbert & Bennett Mfg. Co., 273 Pearl, N. Y. ... 2
New Haven Wire Works, 58 Cliff, N. Y. ... 2
Prentiss Geo. W. & Co., Holyoke, Mass. ... 2
Roberts Henry, Newark, N. J. ... 2
Townsend W. P. & Co., Pittsburgh, Pa. ... 4
Washburn & Moen Mfg. Co., Worcester, Mass. ... 2
Trenton Iron Co., Trenton N. J. ... 2

Wire Cloth.
Irvine A. A., 14 Murray, N. Y. ... 11
Young Oscar W., 104 Broadway, Brooklyn, N. Y. ... 2

Wire Gauges.
Brown & Sharpe Mfg. Co., Providence, R. I. ... 9

Wire Goods. *Manufacturers of.*
A. A. Arnold, New Haven, Conn. ... 2
Belmer H. & Co., Cincinnati, O. ... 2
Corning Jasper E., 58 Cliff, N. Y. ... 2
Gilbert & Bennett Mfg. Co., 273 Pearl, N. Y. ... 2
Greenleaf G. & Co., 90 Union, Boston, Mass. ... 2
Howard & Morse, 45 Fulton, N. Y ... 2

Wire Nails.
Hassall William, 63 & 65 Elizabeth, N. Y. ... 17
The American Wire Nail Co., Covington, Ky. ... 17

Wire Rope, Iron and Steel. *Makers of.*
Hazard Mfg. Co., Wilkesbarre, Pa. ... 2
Roebling's John A. Sons, Trenton, N. J. ... 2

Wooden Ware.
Adams F. F. & Co., Erie, Pa ... 29

Wrenches, *Manufacturers of.*
Austin J. & Co., 115 Liberty, N. Y. ... 38
Bemis & Call Hdw. & Tool Co., Springfield, Mass. ... 32
Coes A. G. & Co., Worcester, Mass. ... 34
Coes L. & Co., Worcester, Mass. ... 25

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Alexander T. J., Boston, Mass. ... 29
Peerless Wringer Co., Cincinnati, O. ...
The American Machine Co., Philadelphia ... 18

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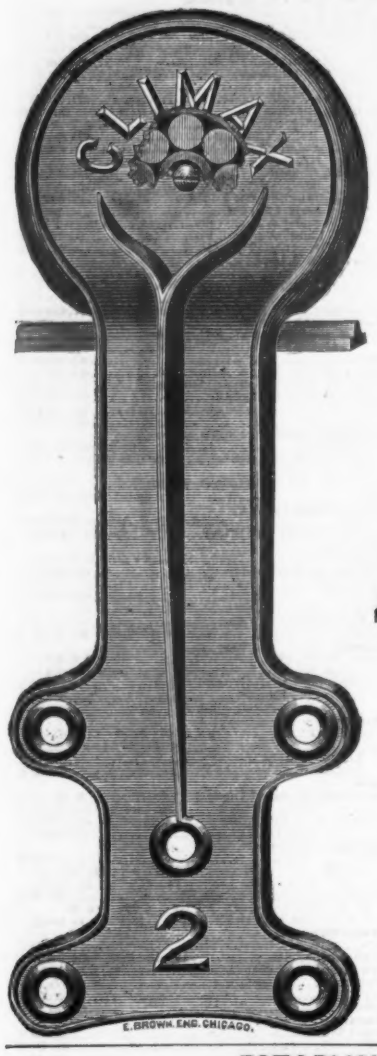

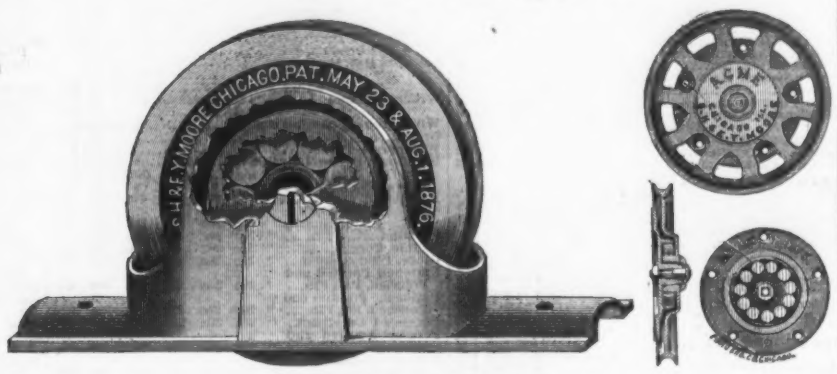

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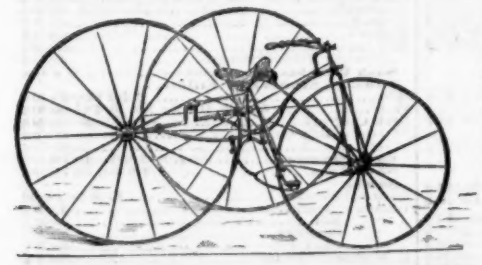

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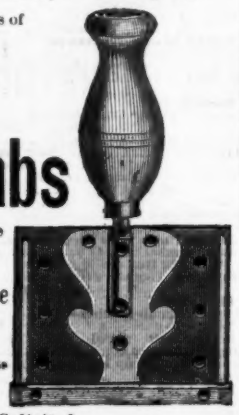

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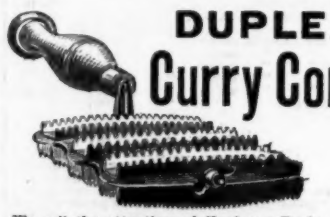

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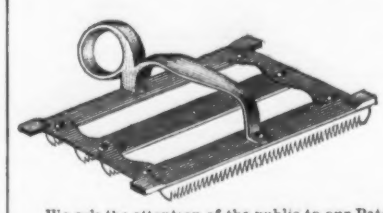

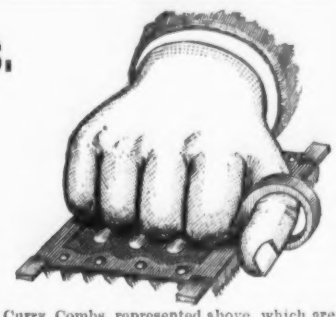

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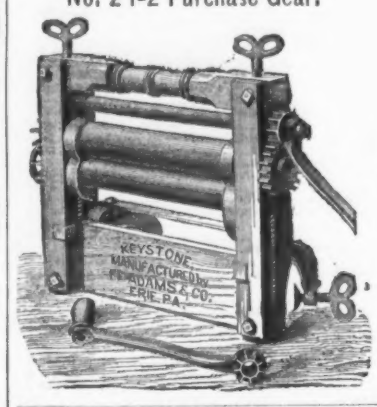
KEYSTONE WRINGERS.

No. 2 1-2 Purchase Gear.



No. 1, Wood Frame without Gears.
No. 2, Iron " " "
No. 2¼, Wood Frame, Purchase Gear.
No. 3, Iron " " "
No. 10, Wood " Common "
All have 1¾ in. by 10 in. Rolls.

Protection in Sale Guaranteed.

Other Household Goods for Home and Export Trade.

F. F. ADAMS & CO.

ERIE, PA.

CHAS. D. & W. S. GRAHAM,
No. 88 Wall Street, New York,
AGENTS.

Harvey W. Peace, Vulcan Saw Works.

Manufacturer of every kind of

Patent Ground SAWS.

TRADE MARK. HARVEY W. PEACE & Co.

Circulars, Cross-Cuts, Mill, Mulay, Gang, Hand, and Butcher.
Molding and Planing Knives.
Plastering Trowels, Mitering Rods, &c.

Union Avenue, Tenth and Ainslie Streets, BROOKLYN, E. D., N. Y.

E. M. BOYNTON,

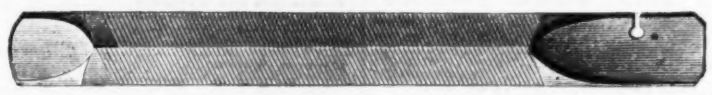
Manufacturer of all kinds of

First-Class Saws, Saw Frames, Cross-Cut Handles, Tools, Files, &c.
Also Sole Proprietor and Mfr. of the Genuine Patent Lightning Saw,
No. 80 Beekman Street, NEW YORK.

Special attention is called to my new Centennial Saw, patented March 28th, 1876; Special File and Saw-Set combined, patented June 20th, 1876; Cross Cut (Loop) Saw Handle, patented February 15th, 1876; New One-Man Saw, with Patent Double Removable Handle Attachment, March 28th, 1876; New Patent Champion Clearer Tooth, patented August 15th, 1876; Saw Set, patented Nov. 25th, 1873—a perfect Set that a blind man can use to condense like a Hammer Set perfectly; Cross-bar Wood Saw Frame, patented Nov. 12, 1872; also Cross-Cut Handle, with castings, patented Feb. 15, 1870.

These goods complete the scientific tools for cutting timber, instead of wearing it off with notched V teeth (which are like a fractured plate sharpened).

AWARDED CENTENNIAL MEDAL AFTER ACTUAL TEST.



PHILADELPHIA, November 11th, 1876.

REPORT ON AWARDS. GROUP No. 15.

Product: Saws in great variety; special improvement in shape of teeth, called Patent Lightning Saw.
Name and Address of Exhibitor: Eben Moody Boynton, New York.

The undersigned having examined the product herein described, respectfully recommends the same to the United States Centennial Commission for award, for the following reasons, viz:
Report: "Being of very Superior Quality and of great Practical Utility." DANIEL STEINMETZ, Signature of the Judge.

J. D. IMBODEN, of Virginia, CHARLES STAPLES, of Maine, G. L. REED, of Penn., } JUDGES.
J. DIFENBACH, of Germany, DAVID McHARDY, of Scotland, D. STEINMETZ, of Phila. }
A true copy of the record. FRANCIS A. WALKER, Chief of the Bureau of Awards.
Given by authority of the U. S. Centennial Commission.
J. L. CAMPBELL, Sec'y. A. T. GOSHORN Director General. J. R. HAWLEY, Prest.

E. C. ATKINS. *ESTABLISHED 1857.* H. KNIPPENBERG.

E. C. ATKINS & CO., Indianapolis, Ind.,

Saw Manufacturers and Repairers.

Sole manufacturers of the celebrated

GENUINE SILVER STEEL DIAMOND X CUT SAW.

$1.50 Per Foot.

PATENT HANDLES AND GAUGE INCLUDED.

☞ BEWARE OF THE IMITATION CALLED "DIAMOND TOOTH." ☜

Wheeler, Madden & Clemson

MFG. CO.,

MIDDLETOWN, - - - - NEW YORK.

Manufacturers of

WARRANTED CAST STEEL

SAWS

Of every description, including

Circular, Shingle, Cross-Cut, Mill, Hand,

WOOD SAWS. Etc., Etc.

AMERICAN SAW CO.,

Manufacturers of

Movable Toothed Circular Saws,

PERFORATED CROSS-CUT SAWS

And SOLID SAWS of all kinds. Trenton, N. J.

New York Wholesale Prices, June 13, 1877.

HARDWARE.

Anvils.
American ... ℘ lb 15c. dis 20 %
Wright's ... ℘ lb gold 10½c; over 250 lbs 11c, gold
Armitage's Mouse Hole ... gold 10 @ 10½c
Wilkinson's ... ℘ lb gold 11c
Eagle Anvils (American) ... ℘ lb 9c dis 20 %

Apple Parers.
Bay State Parer, Corer and Slicer ... ℘ doz $12 00 net
Improved Turn Table ... ℘ doz 7·50 net
Faultless Turn Table ... ℘ doz 7·50 net
New Lightning ... ℘ doz 7·50 net
"Old Reliable" ... ℘ doz 5·00 net
Climax Corer and Slicer ... ℘ doz 6·00 net
Lightning Peach Parer ... ℘ doz 12 00 net

Augers and Bits.
Conn. Valley Mfg. Co.; Douglass Mfg. Co.; Ives; Beecher (French, Swift & Co); Griswold; Nobles Mfg. Co; Kasson's Patent } 1st qual ... dis 45&5 %; 2d quality. dis 50&5 %
Cook's, Douglass Mfg. Co ... dis 50&5 %
" Ives' ... dis 50 %
Snell Mfg. Co ... dis 30&10 %
Jennings' Bits ... dis 10 %
Ives' "Jennings" Bits ... dis 10&10 %
Lewis' Single Twist Bits ... dis 25 @ 30 %
Andrews Bits ... dis 40&10 %
Griswold's Patent Bits ... dis 30 %
Expansive Bits, Clark's small, $18; large, $26, dis 15 @ 20 %
" " Ives ... $20 @ $30—dis 30 %
" " Blake's ... $30—dis 40 %
" " Parmelee's ... small, $20; large, $36 ... dis 25 %
Hollow Augers, Ives' } dis 33⅓ @ 40 %
" " French, Swift & Co. }
" " Bonney's Adjust.. ℘ doz $48—dis 25&10 %
" " Stearns' Adjust... ℘ doz $48—dis 25&10 %
" " Ives' Expansive ... each $4·50—dis 40 %
" " Universal Expansive. each $4·50—dis 10 %
Gimlet Bits—Screw, $7·50; no screw, $9 ... dis 40 %
" " Diamond ... per doz $1·00 dis 10 %
Double Cut Gimlet Bits, Shepardson's ... dis 30 %
" " Ct. Valley Mfg. Co.. dis 30&10 %
" " Hartwell's ... dis 50&5 %
" " Douglass' ... dis 25&10 %
" " Ives' ... dis 33⅓ %
Morse's Bit Stock Drill, List of Jan'y 1, '76 ... dis 25 %
L'Hommedieu's Ship Augers ... dis 20 %
Watrous Ship Augers ... dis 30 %

Awls, Brad Sets, &c.
Awls, Sewing, Common ... per gross $1·25—dis 25 %
" " Best ... per gross $1·60—dis 10 %
" Shouldered Peg ... per gross 2·25—dis 15 %
" Patent Peg ... per gross ·60—dis 15 %
" Shouldered Brad ... per gross 2·70—dis 25&10 %
Brad Sets, Aiken's ... per doz $12·00—dis 40 %
" No. 42, $10·50; No. 43, $12·50 ... dis 60 %
" Clark's ... dis 50 %
" Stanley's Excelsior ... No. 1, $11·00, dis 25&10 %

Axles.
Common (Guy C. Hotchkiss, Field & Co.) ... ℘ lb 4½c
Solid Collar, Case Hardened, Chilled Box ... ℘ lb 8c
Axle Grease.—Frazer's ... ℘ lb 6c.

Balances.
Light or "Common" ... dis 25&10 %
All other Spring Balances ... dis 25 %
Bands.—Plated ... new list dis 50&5 %
Iron Rim ... new list dis 25&5 %
Brass (Plated list) ... new list dis 50, 10&5 %
Orcide ... new list dis 50&5 %

Bed Keys.
Gray's Ratchet ... ℘ doz $4 00, dis 15 %

Bells.
Hand, Light Brass ... dis 75 %
" Extra Heavy ... dis 40&10 %
" White Metal ... dis 50&10 %
" Silver Chime ... dis 20&10 %
" Swiss ... dis 35 %
" Globe (Cone's Patent) ... dis 20&10 %
Gong Abbe's ... dis 20&10 %
" Yankee ... dis 35&10 %
" Barton's ... dis 35 %
Crank, Taylor's ... dis 25&10 %
" Brook's ... dis 50 %
" Cone's ... dis 10 %
" Connel's ... dis 50&10 %
Lever, Sargent's ... dis 60&10&10 %
" Taylor's Bronze or Plated Lever ... net
" " Japanned Lever ... dis 25&10 %
" Hart, Bliven & Mead Mfg. Co ... dis 50&10 %
Pull " " " ... dis 50&10 %
" Brook's ... dis 50 %
" Western ... dis 25&10 %
Call ... dis 20 %
Cow—Common Wrought ... dis 20&10 %
" Western ... dis 20&10 %
" " Sargent's ... dis 60&10 %
Kentucky "Star" ... dis 20&10 %
" Sargent's ... dis 60&10 %
Dodge's Genuine Kentucky, new list—
Nos. 0 1 1½ 2 3 4 5 6 Hog.
$12·00 10·00 9·00 8·00 6·00 5·00 3·50 2·50 5·00—dis 40 %
" Yaw's Genuine ... dis 50 %
" Texas ... dis 40 %

Bellows.
Blacksmiths', Common ... dis 20 @ 35 %
" Extra and Pittsburgh Pattern ... dis 30 %
Moulders' ... dis 25 %
Hand Bellows ... dis 20 %
Blind Adjusters.—Domestic ... ℘ doz $3—dis 20 %
Blind Fasteners.
Mackrell's ... dis 30 %
Van Sand's ... No. 2000, $14·00; dis 25 %
" old pattern ... per gross, $10·50, dis 5 %
Washburn's Patent ... ℘ gross $14·00 dis 25 %
Merriman's ... new list net
Security Blind Fast ... per gross, $14·00, dis 10 @ — %
Blind Staples.
Boardman's Patent, ⅜ in. and larger ... ℘ lb 37 c
" ⅜ in ... " 42 c
Blocks.
Differential Pulley Blocks ... dis 20 %
Tackle, Rope and Iron Strapped, Providence Tool Co.'s list ... dis 30&10 %
Stanley Rule and Level Co ... dis 25&10 %
Blowers.
Keystone Portable Forge Co ... dis 20 %
Bolts.
Cast Iron Barrel, Shutter, &c ... dis 60&10&10 %
Cast Iron Chain ... dis 60&10&10 %
Wrought Iron Barrel ... dis 50, 10&10 %
" " Square ... dis 50, 10&10 %
" " Shutter (Stanley's list) ... dis 50 %
" " " (Sargent's new list). dis 50, 10&10 %
" " Flush, Stanley's ... dis 15&10 %
" " " Sargent's ... dis 50&10&10 %
Carriage and Tire, Common ... dis 75&5 % cash
" " " Norway Iron ... dis 50&10 %
" " " R. B. & W ... (old list) dis 65&5 %
" " " Philadelphia ... dis 60&10 %
" " " Shelton's ... (old list) dis 65&5 %
Union Nut Company, old list ... dis 60&5 %
Stove—American Screw Co.'s ... dis 45 @ 50 %
" R. B. & W ... dis 50 %
" Shelton's Shaved Head ... dis 45 %
" Union Nut Co ... dis 45 %
Plow, R. B. & W ... dis 40 %
Machine ... dis 65 @ 70 %
Bolt Ends ... dis 60
Borax ... 12 @ 12½c. ℘ lb

Boring Machines.	Upright.	Angular.
Hovey's, no Augers	$3·15	$4·00 net
" with Augers	5·00	6·00 net
Parr's, no Augers	5·00	7·50 dis 30 %
" with Augers	7·50	10·00 dis 30 %
Kellogg's, no Augers	5·25	6·75 dis 15 %
Sweets'	3·25	4·00 net
" with Augers	5·00	6·00 net
Snell's "	4·75	6·25 dis 25 %
Phillips' with Augers	.....	10·00 dis 25 %

Bow Pins.
Union Nut Co ... dis 60&5 %
Hotchkiss' ... dis 55 %
Humason, Beckley & Co.'s ... dis 60 %
Sargent & Co.'s ... $19·70 and $21·40, dis 60&10 %
Braces.
Barber's Patent ... dis 40&5 %
Q. S. Backus ... dis 50 %
Wilson Mfg. Co ... dis 10 %
Spofford's Patent ... dis 50 %
Noble's Patent ... dis 40&5 %
Ives' "Centennial" ... dis 40&10 %
" "Novelty" ... dis 50 %
Common Ball (American) ... dis 25&10 %
Brackets.—Shelf ... dis 60&10 @ 65&10 %
Bright Wire Goods ... dis 65&10&10 %
Bull Rings.—Union Nut Co ... dis 50&20 %
Sargent's ... dis 66⅔&10 %
Hotchkiss' ... 2½ in., $2·25 net
Humason, Beckley & Co.'s ... dis 60 %
Union Nut Co ... dis 60&5 %
Butchers' Cleavers.
Humason & Beckley Mfg. Co ... dis 20 %
D. R. Barton Tool Co ... dis 20 %
Bradley's ... dis 25 %
Beatty's ... dis 20 %

1	2	3	4	5	6	7	8
$16·50	$19·00	$21·50	$24·00	$27·00	$30·00	$33·50	$36·50

Hart Mfg. Co ... dis 50&10 %

0	1	2	3	4	5	6
$25·25	$29·75	$31·25	$35·75	$40·25	$46·50	$54·00

Butts.
Wrought Brass ... dis 50 %
Cast Brass ... dis 30 %

COMMON CAST, NOT DRILLED.
Fast Joint, Narrow ... dis 45 %
" Broad ... dis 55 %
" Jap'd ... dis 50 %
Loose Joint, Narrow and Broad ... dis 60 %
" " Jap'd ... dis 60 %
Parliament Butts & Mayer's Hinges ... dis 55 %
Loose Pin ... dis 60 %
Loose Pin Japanned ... dis 65 %
Loose Pin Jap'd, Plated Tips ... dis 60 %
} 10 % for cash.

DRILLED AND WIRED.
Fast Joint, Narrow ... dis 40
" Broad ... dis 50
Fast Joint, Broad, Japanned ... dis 45
Loose Joint ... dis 55
" Japanned ... dis 55
Parliament & Mayer's Hinges ... dis 50
Loose Pin, no Acorn ... dis 57½
" Acorns ... dis 55
" " Japanned ... dis 60
" " Plated Tips ... dis 55
} 10 % for cash.

Union Mfg. Co.'s Fancy Butts.—
Figured Enameled Loose Joint ... dis 55&10 %
Boston Finish, Plain ... dis 60&10 %
Boston Finish, with Iron Acorns ... dis 75&10 %
" " with Sil'd " ... dis 65&10 %

WROUGHT IRON.
Fast Joint, Narrow ... dis 40&10 %
" Lt. Narrow ... dis 30&10 %
" Broad ... dis 40&10 %
Loose Joint, Broad ... dis 40&10 %
Table Butts, Back Flaps, &c ... dis 35&10 %
Inside Blind, Regular ... dis 35&10 %
" " Light ... dis 40&10 %
Loose Pin. Wrt ... dis 40&10 %
Am. Spiral Spring Butt Co., Japanned ... dis 25 %
" " " Fancy ... dis 10 %
Sabin Mfg. Co., Double Acting ... dis 35 %
Union Spring Hinge Co ... dis 25 %
Union Mfg. Co. Spring Hinges ... dis 25 %
Blind Butts, Parker ... dis 70&10 %
" Palmer ... dis 40&10 %
" Seymour ... dis 60&10 %
" Shepard ... dis 60 %
" Lull & Porter ... dis 60 %
" Nicholson ... dis 45&10 %
" Huffer ... dis 33⅓&10 %
" Garretson ... dis 60 %
" Clark's, Nos. 1, 3, 5, 40 and 50 ... dis 60 %
" " Nos. 2 4, 4½, 6, 8, 10 ... dis 50&10 %
" Sargent's ... dis 70&5&10 %

Can Openers.
Messenger's Comet ... per doz $3·00 dis 20 %
American ... per doz 2·25 dis 50&5 %
Lyman's ... per doz 3·75 dis 20 %
No. 4, French ... per doz 2·25 dis 50 %
No. 5, Iron Handle ... per doz 2·25 dis 50&5 %
Sprague's ... Nos. 1 2 3
Per doz $2·00 2·25 2·50 dis 25 %
Eureka ... per doz $2·50 dis 10 %
Sardine Scissors ... per doz $7·00 dis 40 @ 40&5 %
Caps—Percussion, per 1000.
Hicks & Goldmark's G. D. & S. R ... 37 @ 40c
" " E. B. 1-10 Ground ... 70c dis 5 %
" " E. B. 1-10 Turned ... 68c dis 5 %
" " D. W. P. 1-10 ... $1·40 dis 5 %
" " D. W. P. ⅛ ... $1·35 dis 5 %
" " Colt's 1-10 ... 70c dis 5 %
Ely's E. B ... 1-4s, 58c.; 1-10s, 70c. gold
" Double Waterproof, 1-4s, $1·30; 1-10s, $1·58c., gold
Colt's ... 1-10s, 80c., gold
Carpet Sweepers.
Union ... each $2 75 net
Welcome ... each 2 75 net
Cartridges.—Metallic ... dis 60 %
Cards.—Horse and Curry ... dis 30&10 %
Cotton ... dis 10&10 %
Wool ... dis 15&10 %
Carpet Stretchers.
Cast Steel, Polished ... per doz $5·00 dis 30 %
Cast Iron, Steel Points ... per doz $2·00 dis 45&5 %
Casters.
Bed ... dis 55 %
Plate and Shallow Socket ... dis 55 %
Deep Socket ... dis 40 %
Cattle Leaders.
Hotchkiss' Sons' ... net
Humason, Beckley & Co.'s ... dis 60 %
Sargent's ... dis 60&10 %
Union Nut Co ... dis 60&5 %
Chain.
English Coil ... net gold
℘ lb ... 11½ 8¾ 7⅝ 7¼ 7⅛ 7c
3-16 ¼ 5-16 ⅜ 7-16 ½
Trace, 6½-10-2 ... by the cask, ℘ pair, gold 50 @ 52c
Trace, 7-10-2 ... by the cask, ℘ pair gold. 55 @ 57c
German Halter Chain ... dis 25 @ 30 % gold
German Coil ... dis 25 @ 30 % gold
Galvanized Pump Chain ... ℘ lb 10½c.
Jack Chain Iron ... dis 55&10 %
" Brass ... dis 45&10 %
Chalk.
White ... ℘ gross, 55c net
Red ... ℘ gross, 75c net
Blue ... ℘ gross, 90c net
White Crayons ... ℘ gross, 14c net
Chisels.
D. R. Barton Tool Co. (all kinds) ... dis 20 %
Socket Framing, Crossman ... dis 60&5 %
" " Buck Bros ... new list dis 17½ @ 20 %
" " Hart Mfg. Co., No 1 ... dis 60&10&10 %
" " Merrill ... dis 60&10 %
" " Witherby Tool Co ... dis 60&10 %
" Firmers, Crossman ... dis 60 %
" " Buck Bros ... new list dis 17½ @ 20 %
" " Hart Mfg. Co., No. 1 ... dis 60&10 %
" " Merrill ... dis 60&10 %
" " Witherby Tool Co ... dis 60&10 %
Socket Corner ... dis 65 @ 70 %
Tanged Firmers, extra ... dis 40 %
" " Butcher's ... $5·25 to £ gold
" " Newbould's ... $5·50 to £ gold
" " Spear & Jackson's ... $5·00 to £ gold
" " Buck Bros (Shank) ... $5·25 to £ gold
Clamps.
Iron, Providence Tool Co.'s, Wrt. Iron ... dis 25 %
" Adjustable, Gray's ... dis 20 %
" " Lambert's ... dis 20 %
" " Snow's ... dis 40&5 %
" " Hammer's ... dis 15 %
" Cabinet, Sargent's ... dis 60&10 %
" Carriage Makers', Sargent's ... dis 60&10 %
Coffee Mills.
Board and Box ... dis 25 %
Increase Wilson's ... dis 25 %
Seiser's Pat ... $9·50, $10·50—dis 25 %
American (Enterprise Mfg. Co.) ... dis 20 %
French Steel ... dis 20 %
The Swift ... dis 25 %
Compasses and Dividers.
Bemis & Call Co.'s ... dis 35&10 %
Cook's ... dis 15 %
Excelsior ... dis 40 %
Miller's Patent ... dis 25&10 %
Coopers' Tools.
Bradley's ... dis 15 @ 20 %
Chas. E. Little ... dis 20 @ 25 %
D. R. Barton Tool Co ... dis 20 %
Corkscrews.—Humason & B ... dis 33⅓ %
Corn Knives and Cutters.
Bradley's ... dis 10 %
Crow Bars.
Cast Steel ... ℘ lb 9c. net
Iron, steel points ... ℘ lb 5c
Crucibles.—Gautier & Co ... ℘ No. 5½c
Curling Irons, &c.
⅛, ⅜, ¼ in., $1·80, $2·00, $2·40 ... dis 10 %
Curling Tongs ... ℘ doz $6 50—dis 15 %
Pinching Irons ... ℘ doz 7 50—dis 20 %
Curry Combs.
Curry Comb Mfg. Co ... dis 25&10 %
Fitch's (List of No. 240, $1) ... dis 30&10 %
Hotchkiss' & Kellogg's, Iron & Brass, old list. dis 40&7½ %
Hotchkiss' Novelty ... dis 10&10 %
Rubber ... ℘ doz, $9·00—dis 15 %
Wood Tooth (Fuller Bros.) ... per doz $2·25 net
Clips, Axle.
Norway or Best ... dis 50 %
Superior ... dis 55 %
Cockeyes ... 1¼ in., 28c.; 1½ in., 35c.; 1¾ in., 37c. net
Cocks.
Brass Racking ... dis 50 %
Lock and Globe ... dis 50 %
Lever Bibbs ... dis 50 %
Ale and Beer ... dis 40 @ 45 %
Curtain Pins.—Silvered Glass ... new list dis 15 %
Cutlery.
Am. Pocket—Humason & Beckley Mfg. Co ... dis 25 %
Am. Miller Bro.'s Cutlery Co ... dis 25 %
Naugatuck Cutlery Co ... list net
Rogers Cutlery Co ... net
Dippers.
Britannia ... per doz $3·75 @ $4·25 net
Cocoa, Plain ... per doz $3·25—dis 20 %
" Rimmed ... per doz 3·75—dis 20 %
Dog Collars.
Embossed Gilt ... dis 20 %
Leather ... dis 30 %
Brass ... dis 25 %
Door Springs.
Torrey's Rod ... ℘ doz $2·10 net
Gray's " ... ℘ doz $2·00 net
Johnson's " ... ℘ doz $3·00 net
Gem (Coil)—
No. 1, Large, Japanned ... per doz $3·50 }
No. 2, Medium, " ... per doz 2·50 } dis 10 %
No. 3, Small, " ... per doz 2·00 }
Challenge (Coil)— Nos. 9 7 6
Japanned ... per doz $2·00 2·50 3·50 }
Coppered ... per doz 4·00 4·50 5·00 } dis 10 %
Galvanized ... per doz 3·50 4·00 4·50 }
Nickeled ... per doz 5·50 6·00 7·00 }
Premium (Coil)— Nos. 1 2 3
Japanned ... Per doz $7·50 6·25 5·00 } dis 30 %
Nickeled ... Per doz 11·00 9·50 8·00 }
Star (Coil)—(For Cop'd, Nickel Plated, &c., see list.)
No. 5, Small ... per doz $2·00 }
No. 6, Medium ... per doz 2·50 } dis 15 %
No. 7, Large ... per doz 3·50 }
Philadelphia ... 5 in., $5·00; 8 in., $7·00 dis 25 %
Barker's Concealed ... dis 15 %
Drawing Knives.
Crossman's No. 1 ... dis 60&5 %
D. R. Barton Tool Co ... dis 20 %
Hart Mfg. Co., No. 1 ... dis 60&10&10 %
Merrill ... dis 60&10 %
Nobles Mfg. Co ... dis 15 %
Bradley's ... dis 25 %
Adjustable Handle ... dis 20 %
Witherby Tool Co ... dis 60&10 %
Drills and Drill Stocks.
Blacksmiths' ... each $2 50 dis 10 %
" Self-Feeding ... each $7 50 dis 10 %
Breast, P. S. & W ... dis 25 %
Breast, Aiken's ... dis 25&10 %
" Hotchkiss ... dis 10 %
" Wilson's ... dis 10 %
" Miller's Falls ... each $2·50, dis 25 %
Ratchet, Merrill's ... dis 20 %
" Ingersoll's (old list) ... dis 35 %
" Whitney's ... dis 20 %
" Weston's ... dis 20 %
" Moore's Triple Action ... dis 20 @ 25 %
Wilson's Drill Stocks ... dis 10 %
Automatic Boring Tools ... each $2·75, dis 20 %
Drill Chucks.
Danbury ... each $8·00, dis 30 %
Morse's Beach Patent ... dis 30 %
" Adjustable ... each $10·00, dis 30 %
Egg Beaters.
Dover ... ℘ doz $5·00—dis 20 %
National ... ℘ doz $4·50—dis 33⅓ %
Schofield ... ℘ doz $3·50
Emery.
Genuine Chester—Regular Nos ... ℘ lb 6c } dis 10 %
" Flour and FF ... ℘ lb 4c }
Washington Mills—Regular Nos ... ℘ lb 8c
" Flour ... ℘ lb 5c
Wellington Mills, Grain ... ℘ lb 10c. net
" " Flour ... ℘ lb 8c. net

Enameled and Tinned Ware.
Kettles ... dis 40 @ 50 %
Sauce Pans ... dis 50 @ 55 %
Glue Kettles ... dis 50 @ 55 %
Tinned Saucepans ... dis 30 @ 35 %
Escutcheons.
Door Lock ... Same discounts as Door Locks
Brass Thread ... dis 60&10 %
Wood ... dis 25 %
Faucets.
Fenn's ... dis 50 %
" Cork Stops ... dis 40 %
Star ... dis 55&10 %
Frary's Patent Petroleum ... dis 20&10 %
Wood and Metallic ... dis 40 %
Wood, Cork Lined ... dis 65&10 %
Enterprise Mfg. Co., Self-Measuring ... dis 20 %
Felloe Plates ... ℘ lb 15c; dis 40&10 %
Files.
American File Co ... $5 00 to £ currency—dis 30 %
Arcade File Works ... $5·00 to £ currency
Auburn File Works ... $5 00 to £ currency
C. B. Paul's ... $5 00 to £ currency
Heller & Bros ... $4 50 to £ currency
Hiscox File Mfg. Co ... $5 00 to £ currency, dis 15 %
Johnson & Bro ... $5 00 to £ currency
Madden & Cockayne File Co ... $5 00 to £ cur., dis 15 %
Jowitt's ... 4 50 to £ gold
J. & Riley Carr ... 5 00 to £ gold
Stubs' ... 7 50 to £ gold
Butcher's ... 4 50 to £ gold
Walter Spencer & Co.'s "Diamond" ... 4 50 to £ gold
Fisher's ... 4 75 to £ gold
Moss & Gamble ... 4 75 to £ gold
Thos. Turner & Co. (Peter A. Frasse & Co.) 4 50 to £ gold
" Horse Rasps ... 5 00 to £ gold
H. Disston & Sons ... dis 30 %
Limet & Co. (French) ... 4 25 to £ gold
Boyton's Cant ... dis 40 %
Fluting Machines
Mrs. Coles' ... 5 in., $6·00; 7 in., $7·00, dis 25 %
" Pony..4 in., $4·75; 5 in. $5; 6 in. 5·50; 7 in. $6 dis 25 %
Mrs. Knox, No 1876 ... each $5·20, dis 30&10 %
Knox Imperial, 1877 ... $5·20; dis 20&10 %
Knox, 4 inch Rolls ... $3 25 each dis 10 %
" 6 " ... 3 80 each dis 10 %
" 8 " ... 5 00 each dis 10 %
Peerless, 4-inch Rolls ... 4 00 each net
" 5 " " ... 4 75 each net
Improved Knox (Climax), 4 inch ... 2 65 each net
" " 6 " ... 3 15 each net
" " 8 " ... 4 90 each net
Eagle, 3½-inch Roll ... $18·00 per doz net
" 5½ " " ... 24·00 per doz net
Champion, 6 inch rolls ... 6 00 each net
" 4 inch rolls ... 5 00 each net
Empire ... 4 00 each net
Eureka, No. 1, 7-inch Roll ... 6 75 each net
" No. 2, 5-inch Roll ... 5 00 each net
Defiance ... 4 in., $3·50; 6 in., $4·00; 8 in., $6·50 each net
K. F. M., 4½-inch Roll ... 3 50 each net
" 6-inch Roll ... 4 00 each net
Crown ... 4½ in. Roll, $2·50; 6 in., 3·00; 8 in., 4·25 each net
Domestic Fluter ... $1·00 each net
Geneva Hand Fluter ... $15 00 per doz net
Combined Fluter and Sad Iron ... ℘ doz $15·00 dis 10 %
Fluting Scissors ... dis 35&10 %
Forges.
"Empire" (W. P. Kellogg & Co ... dis 20 %
Keystone Portable Forge Co ... dis 20 %
Forks.
Hay, Manure & Spading ... dis 35 %
Plated A 1 ... dis 40&5 %
" Reed & Barton ... dis 40&5 %
Fruit and Jelly Presses.
Enterprise Mfg. Co ... dis 20 %
Fry Pans.
Burnished, P. S. & W., new list ... dis 55 %
℘ doz ... $3·00 3·75 4·25 ·75 5·25 6·00 7·00 8·00 9·00
No. ... 0 1 2 3 4 5 7 8
Gauges.
Marking ... 45&10 %
" Star ... dis 35 %
Wire ... dis 10 %
" Smith's Patent ... doz $18·00, dis 40 %
Gimlets.
Nail and Spike ... dis 40 %
"Bee" Gimlets ... per gross, $12·00, dis 45 %
"Eureka" Gimlets ... dis 40 %
Double Cut, Shepardson's ... dis 20 %
" " Hartwell's ... dis 40 %
" " Ives' ... dis 33⅓ %
" " Douglass' ... dis 25&10 %
Glue Pots.
Tinned and Enameled ... dis 35 @ 40 %
Family, Howe's "Eureka" ... dis 25 %
" L. F. & C.'s "Handy" ... dis 25 %
Grind Stone Fixtures
Sargent's Patent ... dis 70&10&10 %
Reading Hardware Co. (New List) ... dis 40&10 %
Hart Mfg. Co.'s ... dis 60&5&10 %
Rick Bros ... dis 45&5 %
Hammers.
Emmet Hammer Co.'s Handled ... dis 25 %
" Sledge & Stone. ℘ lb 40c.; dis 40 %
Humason & Beckley Mfg. Co ... dis 33⅓ %
Maydole's ... New List, Jan. 1, '77, dis 15 %
Henry Hammonds' ... new list Jan. 1, 1877. dis 15&5 %
Cheney's, Steel Face and Claw ... dis 10 %
" all steel ... dis 20&10 %
Verree ... dis 5 %
Magnetic Tack ... dis 25&10 %
Warner & Noble's ... dis 10 %
Hand Cuffs and Leg Irons.
Tower's Hand Cuffs, $4 00 per pair } dis 35 %
" Leg Irons $6 50 per pair }
Providence Tool Co.'s Hand Cuffs.. $15 per doz } dis 10 %
" Leg Irons ... 25 " }
Handles.
Door or Thumb Latches—
Nos. 0 1 2 3 4
Per doz $0·80 1·00 1.18 1.35 1·50—dis 60&10 %
Roggin's Latches ... 35c. @ 40c. net
Bronzed Iron Drop Latches ... per doz $1·00 @ 1·25 net
Wrought Chest ... dis 60&10 %
Surface Chest, Sargent's list ... dis 60&10&10 %
Flush Chest ... dis 60&10&10 %
Lifting ... dis 60&10 %
Saw and Plane ... dis 25&10 %
Boyaton's X Cut (Loop) ... dis 20 %
" X Cut (Centennial) ... dis 15 %
Hammer and Hatchet ... dis 10 %
N. Carolina Handle Co ... dis 15 %
Brad Awl ... per gross $3 75, dis 25&10 %
Hickory Firmer Chisel, ass'td " 5 25
" " " large " 6 50
Apple " " ass'td " 6 00
" " " large " 7 50
Socket " " ass'td " 4 50 } dis 40 %
" Framing " " " 7 00
File ... " " 3 50
Auger ... " " 6 00
" large " 7 00
Patent Auger, Ives' ... dis 25&10 %
" Douglass' ... per set $1 25—dis 10 %
" Swan's ... per set $1 00—dis 20&10 %
Hangers.—Barn Door ... dis 70&10 %
"Anti-Friction" No. 1, $1·25; No. 2, $1·50 ℘ pr. dis 40&10 %
Novelty ... dis 40 %
Challenge ... dis 50 %
Climax ... dis 40 %
Harness Snaps.
Henshaw's ... List of 1½ changed to $14·00, dis 42½ %
Judd's " " 14·00, dis 50 %
Fitch's (Bristol) " " 14·00, dis 45 @ 50 %
Hotchkiss' ... dis 10 %
Andrews' ... dis 45 %
Sargent's ... dis 60&10 %
New York Wire ... dis 20&20 %
"German" ... dis 50 %
Hatchets.—Isaiah Blood ... dis 15 %
Shingling, Nos. 1 2 3 ... ℘ doz $7 25 8 00 8 75
Claw, " 1 2 3 ... ℘ doz 7 75 8 50 9 25
Lathing, " 1 2 3 ... ℘ doz 7 50 8 00 8 50
Hunt's ... dis 25 %
Shingling, Nos. 1 2 3 ... ℘ doz $7 25 8 00 8 75
Claw, " 1 2 3 ... ℘ doz 7 75 8 50 9 25
Lathing, " 1 2 3 ... ℘ doz 7 50 8 25 9 00
Hurd's ... dis 30&5 %
Shingling, Nos. 1 2 3 ... ℘ doz $8 00 8 50 9 00
Claw, " 1 2 3 ... ℘ doz 9 00 9 50 10 00
Lathing, " 1 2 3 ... ℘ doz 8 00 8 50 9 00
Newark's Edge Tool Co.'s ... dis 25 %
Shingling, Nos. 1 2 3 ... ℘ doz $6 50 7 00 7 50
Claw, " 1 2 3 ... ℘ doz 7 25 7 75 8 25
Lathing, " 1 2 3 ... ℘ doz 6 50 7 00 7 50
Simmons' ... dis 25 %
Shingling, Nos. 0 1 2 3 ... ℘ doz $7 50 8 00 8 50 9 00
Claw, " 1 2 3 ... ℘ doz 9 00 9 50 10 00
Lathing, " 1 2 3 ... ℘ doz 8 00 8 50 9 00
Broad, " 1 2 3 ... ℘ doz 9 00 10 00 12 00
" " 4 5 6 ... ℘ doz 14 00 16 00 18 00
" " 7 8 ... ℘ doz 20 00 22 00
D. R. Barton Tool Co ... dis 20 %
Shingling, Nos. 1 2 3 ... ℘ doz $11 00 10 50 10 00
Lath, " 1 2 3 ... ℘ doz 10 50 10 00 9 50
Half Hatchets, Nos. 1 2 3 ... ℘ doz 11 00 10 50 10 00
J. P. Verree & Co ... dis 5 %
Shingling, Nos. 1 2 3 ... ℘ doz $7 00 7 50 8 00
Claw, " 1 2 3 ... ℘ doz 7 50 8 00 8 50
Lathing, " 1 2 3 ... ℘ doz 7 00 7 50 8 00
Underhill's ... dis 20 %
Shingling, Nos. 1 2 3 ... ℘ doz 7 25 8 00 8 75
Claw, " 1 2 3 ... ℘ doz 7 75 8 50 9 25
Lathing, " 1 2 3 ... ℘ doz 12 00 11 00 12 00
M. H. Jones & Co ... dis 25 %
Shingling, Nos. 1 2 3 ... ℘ doz $8 00 8 50 9 00
Half Hatchets, Nos. 1 2 3 ... ℘ doz 8 00 8 50 9 00
Claw, Nos. 1 2 3 ... ℘ doz 9 00 9 50 10 00
Lathing, " 1 2 3 ... ℘ doz 8 00 8 50 9 00
Broad, " 2 3 4 ... ℘ doz 11 00 13 00 14 50
" " 5 6 7 ... ℘ doz 16 50 18 00 19 50
Empire Hatchets, M. H. Jones & Co ... net
Shingling, Nos. 1 2 3 ... ℘ doz $4 75 5 00 5 25
Lath, " 1 2 3 ... ℘ doz 4 75 5 00 5 25
Half Hatchets, Nos. 1 2 3 ... ℘ doz 4 75 5 00 5 25
All pol. Sh'gling " 1 2 3 ... ℘ doz 5 25 5 50 5 75
Solid Steel Lath " 1 2 3 ... ℘ doz 7 25 7 50 7 75
Hay Knives.—"Lightning" ... per doz $20·00 net
Wadsworth's ... dis 30 %
Hinges.
Gate, Western ... ℘ doz $6·25—dis 60&10 %
" N. E ... ℘ doz 10·18—dis 60&10 %
Gate, N. Y. State ... ℘ doz 7·20—dis 60&10&10 %
Gate, Clark's No. 1 ... per doz $6·00 dis 45 %
Rolled Plate ... dis 60&10 %
Rolled Raised ... dis 60&10 %
Wrought Strap and T ... dis 60 %
Providence Plate. { 6 to 10 in. 11c ℘ lb; over 10 in. 9½c ℘ lb } ... dis 40&10 %
Screw Hook and Strap ... { 8, 10, 12 in. 11 c; 14 to 36 in. 9½c } dis 40&10 %
Heavy Welded Hook ... { 8 to 12 in. 11 c; 14 in. & up, 9½c } ... dis 30 %
Screw Hook and Eye ... { ⅜ to 1 in., 11c; ⅜ in. 12½c; ¼ in. 13c } ... net
Hoes.
Solid Shank, C. S ... ℘ doz $8 00—dis 40 %
Socket ... ℘ doz 9 00—dis 40 %
Riveted Eye ... ℘ doz 4 75—dis 40 %
Grub ... dis 30 %
Planters ... dis 20@25&10 %
Scovill Pattern ... dis 20@30 %
Lane's C. S. Crescent Planters, Amer. Pattern. dis 20&5 %
" Scovill Pattern ... dis 20 %
Handled Solid C. S. Shank ... dis 35 %
Planters', Handled ... dis 35 %
Scovill Pattern, Handled ... dis 35 %
Hooks.
Bird Cage, Sargent's list ... dis 60&10 %
Cotton ... dis 50 %
Belt ... dis 60&10 %
Bench—Hotchkiss' $5 00 ℘ doz ... dis 10 %
" Weston's No. 1, $8·00; No. 2, $7·00 per doz net
" McGill's ... $3 00 per doz, dis 10 %
" Skinner's ... per doz $6·25, dis 20 %
Clothes Line, Hart's list ... dis 60&10&5&10 %
" " Sargent's list ... dis 60&10&10 %
" " Reading list ... dis 33⅓&5&10 %
Ceiling.. { Hart's list ... dis 60&10&10 %
Harness. { Sargent's list ... dis 60&5&10 %
{ Reading list ... dis 40&10 %
Coat and Hat, Hart's list ... dis 60&10&10 %
" " Sargent's list ... dis 60&10&10 %
" " Reading ... dis 40&10 %
Wrought Staples and Hooks and Staples ... dis 75 %
" " Stanley's list ... dis 40 %
Wire Screw Hooks and Eyes ... dis 65&10&10 %
Grass ... dis 30 %
Whiffletree—Patent ... dis 45 %
Hooks and Eyes—Malleable Iron ... dis 60&10&10 %
" " Brass ... dis 60&10&10 %

Horse Nails.	Nos.	5	6	7	8	9	10
Ausable	℘ lb	30c	27c	25c	24c	23c	22c
" P't'd & Pol'd..	"	31c	28c	26c	25c	24c	23c
" " & Blued..	"	31c	28c	26c	25c	24c	23c
Cortland	"	29c	26c	24c	23c	22c	21c
Buffalo Forged	"	31c	28c	26c	25c	24c	23c
Globe, P't'd & Pol'd	"	31c	28c	26c	25c	24c	23c
National, Pointed and Polished, Pat. Fin	"	28c	25c	23c	22c	21c	20c
National, Pointed and Polished, Ex. Fin	"	30c	27c	25c	24c	23c	22c
Perkin's P't'd—Black	"	26c	23c	21c	20c	19c	18c
Perkins' Pointed and Polished	"	27c	24c	22c	21c	20c	19c
Perkins' Pointed and Blued	"	27c	24c	22c	21c	20c	19c
Putnam Hammer P't'd	"	32c	28c	26c	25c	24c	23c
Vulcan, P't'd & Blued	"	31c	28c	26c	25c	24c	23c

Star Brand, 16c.; Morgan ... 14c
Putnam ... 500 lbs., dis 5 %
Ausable, National and New London ... 1000 lbs., dis 5 %
Perkins' and Vulcan ... 1000 lbs., dis 7½ %
Perkins', Vulcan and Globe ... 500 lbs., dis 5 %
Horse Shoes.
Burden ... ℘ keg, $5·92½
R. I. Horse Shoe Co., Perkins' Improved Light, Med. and Heavy ... ℘ keg, 5·92½
Mule Shoes ... ℘ keg, 4·92½
Perkins' Snow ... ℘ keg, 4·92½
The Boston Horse Shoe ... per keg $5·00
Boston Rolling Mills Hand Made ... ℘ lb 8c
Ice Awls, Chisels, &c.
American Ice Chisel ... per doz $6·50 net
National " " ... per doz $6·50, dis 10 %
Novelty Ice Breakers ... per doz $6·50, net
White's Sliding Head Picks ... per doz $2·50, dis 25 %
Dunlap's Ring Picks ... per doz $3·00, dis 25 %
Wood Head Picks, Sargent's ... per doz $1·85, dis 60&10 %
Iron " " " ... per doz $1·85, dis 60&10 %
Ice Mallets, Pick in Head ... per doz $1·75 net
" Pick in Handle ... per doz $3·00 net
Ice Axes Small, Cast or Malleable ... per doz $1·50 net
Kitchen Ice Tongs ... per doz $2·25 net
Kettles.
Brass ... ℘ lb 45c net
Enameled ... dis 55 %
Knives.
Ames' Butcher Knives ... dis 20 %
" Shoe " ... dis 15 %
" Bread " ... ℘ doz $1·50—dis 15 %
Hay and Straw, "Wadsworth's" ... dis 30 %
Table and Pocket ... See Cutlery
Knobs.
Carriage (Jap'd 80 cents per gross) ... dis 60&10 %
Base—Common ... dis 30&10 %
" Plush Tip ... dis 10 %
" Elastic End, No. 8 ... dis 60&5 %
Door, Mineral ... ℘ doz $1·75 }
" Por. Jap'd ... ℘ doz 2·25 } ... dis 35 %
" " Plated ... ℘ doz 6·25 } & 2 % for cash
" " Por ... ℘ doz 6·75 }
Furniture, Plain ... 75c gross inch, dis 10 %
" Wood Screws ... dis 20 %
Ladles.
Melting, Hart's ... dis 55&10 %
" Sargent's ... dis 50&10 %
" Reading ... dis 15&10 %
" Monroe's Patent ... per doz $4·00 dis 20 %
Lanterns.
Tubular ... No. 0, $11·00; No. 1, $14·00 } dis 5 @ 10 %
With Guards, 50c. extra }
Peerless ... No. 5, per doz $11·75—dis 10&10 %
Brady's Patent ... dis 10&10 %
Ætna ... dis 10 & 10 %
Yankee ... dis 10 & 10 %
De Beque ... dis 10 & 10 %
Police ... small, $7·50 large, $9·00, dis 5 %
Lard Presses.
Draw Cut, 14 inch ... each $65 00—dis 20 %
Enterprise Mfg. Co ... dis 20 %
Lemon Squeezers.
Porcelain Lined ... per doz $7 00, dis 15 %
Eureka, Tinned ... per doz, $10·00 dis 10 %
Dunlap's Improved ... per doz $6·00 net
Sammis Patent ... No. 1, $7·50; No. 2, $12·00 per doz., dis ... 25&10 %
Lines.
Linen Fish ... dis 20 %
Cotton Chalk ... dis 50 %
Sil. Lake Chalk ... Nos. 0, 1, 2, 3, $6, 6·50, 7, 7·50, dis 20 %
Mason's ... dis 20 %
Wire Clothes, Gal'd ... each 50c. net
Locks and Latches.
Cabinet—Gaylord } ... dis 25&5&2 %
" Eagle }
Trunk " ... dis 25 %
Langstroth & Crane's, List Jan. 1, '77.
Round Key ... dis 40&10 %
Flat Key ... dis 33⅓&10 %
Barnes & Deitz, Flat Key ... dis 25 @ 30 %
Yale Lock Co., Flat Key ... dis 40 %
Sargent & Greenleaf, Flat Key ... dis 20 %
Continental ... dis 25 %
Shepardson's, Flat Key ... dis 35 %
American Lock Mfg. Co ... dis 33⅓ %
Plate ... dis 33⅓&2 %
Trenton; Branford; Norwich; Russell & Erwin; Norwalk; Nashua; Mallory, Wheeler & Co.; P. & F. Corbin; Parker & Whipple; Jacobus & Nimick Mfg. Co. } List of Jan. 1, 1877. ... dis 35 % ... and 2 % for cash
Padlocks, Russell & Erwin } ... dis 33⅓&5 %
" Mallory, Wheeler & Co }
" Wm. Wilcox & Co } ... and 2 % for cash
" American Lock Mfg. Co ... dis 33⅓ %
" Romer's ... dis 15 %
" Vulcan Hardware Co ... dis 20 %
" New York Lock Co ... dis 20 %
" J. H. McWilliams ... dis 10 %
" Barnes & Deitz ... dis 30 %
" Miller's Patent ... dis 40 %
" Penn Lock Works ... dis 33⅓ %
" " " (Scandinavian) ... dis 50 %
Mallets.—Hickory and Lignumvitæ ... dis 20 %
Meat Cutters.
Dixon's (P. S. & W.). Nos. 1 2 3 4
℘ doz. $14 00 $17 00 $19 00 $30 00 dis 25 %
Miles Challenge ... Nos 1 2 3
℘ doz. $22·00 $30·00 $40 00—dis 20 %
Perry's .. Nos. 1 2 3 4 4 g'rd 5 g'rd
Each $3·00 $4·00 $5·00 $11·00 $13·00 $35·00—dis 40 %
Woodruff's (P. S. & W.) ... Nos. 140 150
℘ doz. $15·00 $18·00—dis 25 %
Hales' ... Nos. 11 12 13
℘ doz. $27·00 $32·00 $42·00—dis 40&2 %
Draw Cut, Nos. 5 2 6 8 10
Each $50·00 $75.00 $80·00 $225 00 $400·00—dis 20 %
American ... dis 35 %
No. ... 1 2 2½ 3 4 B 5
Each ... $5·00 $7·50 $10·00 $12·00 $25·00 $50·00 $60·00
Molasses Gates.
Stebbins' Pattern ... dis 66⅔&10 %
" Genuine ... dis 60&10 %
" Tinned ends ... dis 40&10 %
Bush's ... dis 20 %
Lincoln's Genuine ... dis 66⅔&10 %
Weed's ... dis 15 %
Mortars and Pestles.
Iron ... net
Mortising Machines ... each $30·00, dis 20 %
Nail Pullers.
Taft's ... per doz $24·00 net
Nails ... See Trade Report
Nuts and Washers.
Square and Hex., New List March 1, '76 ... 7 @ 7½c off st
Oakum.
Best ... ℘ lb 10½c
U. S. Navy ... ℘ lb 9½c
Navy ... ℘ lb 8½c
Oilers.
Zinc and Tin ... new list, dis 45 %
Brass and Copper ... new list, dis 40 %
Olmsted's ... dis 40 %
Broughton's ... dis 40 %
Malleable ... per doz $5 00 dis 10 %
Prior's Patent or "Paragon" ... dis 45 %
Ox Balls ... dis 60&10 %
Pencils
Faber's Carpenters' ... net
" Round Gilt ... ℘ gross $6 00 net
Dixon's Lead ... ℘ gross $4·50 net
" Lumber ... ℘ gross 9·00 net
Picture Cord (Wire).
Tinned (Williams, White & Churchill) ... dis 30 %
Lacquered " " " ... dis 30 %
Gold Plated " " " ... dis 70 %

Picture Nails and Knobs.
Brass Head ... Sargent's List, dis 60&10 %
Porcelain Head ... Sargent's List, dis 60&10&10 %
Pinking Irons ... per doz $2 75—dis 65&10 %
Plaiting Machines.
Astor Plaiting Machine ... each $15·00; dis 20 %
Planes and Plane Irons.
First Quality ... dis 35 @ 30&10 %
Second Quality ... dis 50 %
Bailey's Patent Adjustable, new list Jan. '77. dis 25&10 %
Bailey's "Victor" " " ... dis 25&10 %
Defiance Adjustable, new list ... dis 25&10 %
D. R. Barton Tool Co ... dis 20 %
Sandusky ... dis 35 %
Ohio Tool Co ... dis 35 %
Plane Irons, Butcher's ... $5 56 to £ gold—new list
" Buck Bros ... $5 25 to £ gold
" Bailey's Patent ... dis 25&10 %
" Auburn Tool Co.'s ... dis 25 %
" Greenfield Tool Co ... net list
Plane Irons, Defiance ... new list dis 25&10 %
" D. R. Barton Tool Co ... dis 20 %
" Middletown Tool Co ... net list
" Ohio Tool Co ... dis 10 %
" Spear & Jackson's ... 5 00 to £ gold
" Sandusky Tool Co ... dis 10 %
Plow Bits, Greenfield Tool Co ... dis 10 %
Pliers and Nippers.
Button's Patent ... dis 33⅓ %
Hull's Patent Nippers.. No. 1, $15; No. 2, $21 ℘ doz dis 25 %
Gas Pliers ... dis 25 %
Eureka Pliers and Nippers ... dis 25 %
Plumbs and Levels.
Stanley R. & L. Co.'s Pat. Adjustable ... dis 60&10 %
" " " Non-Adjustable ... dis 60&10 %
Chapin's ... dis 60&10 %
Standard Rule Co.'s New Adjustable ... dis 60&10 %
Standard Rule Co.'s Non-Adjustable ... dis 60&10 %
Johnson's Patent Adjustable ... dis 60&10 %
Davis' Patent ... dis 60&10 %
Pocket Levels ... dis 60&10 %
Post Hole and Tree Augers.
Eureka Digger ... per doz $40·00, dis 20 %
Fletcher Post Hole Augers ... per doz $36·00, dis 20 %
Vaughan's Post Hole—
6 in., $23 60; 7, 8 and 9 in. $25 per doz ... dis 30 %
Lee's ... $5 00 each—dis 35 %
Potato Parers, &c.
Bay State ... ℘ doz $12·00 net
"Saratoga" Peeler and Slicer ... ℘ doz 9·00 net
Pulleys.
Judd's Axle ... per doz $0·75 dis 40 %
Hot House and Tackle ... dis 60&10 %
Jap'd Screw ... dis 60&10 %
Brass Screw ... dis 60&10 %
Jap'd Side ... dis 60&10 %
" Clothes Line ... dis 60&10 %
Hay Fork ... per doz $4 50 @ 5 00, dis 10 %
Pumps.
Douglas Cistern, etc ... new list dis
" S. & F ... new list dis
Union Mfg. Co's. Cistern and Pitcher ... dis 35 %
" " " Rams ... dis 25 %
" " " Garden Engines ... dis 20 %
Punches.
Belt or Drive ... per doz $2·00; $2·25; $2·50 dis 30
Spring ... per doz $6·50—dis 25&10 %
" Leach's Patent ... dis 15 %
" Bemis' ... dis 20 %
Rail.
Sliding Door, Wrought Brass ... ℘ lb 40c. net
" " Iron, Painted ... ℘ foot 9c—dis 55&10 %
Barn Door, ⅛, ⅜ and ¼ inch ... dis 65&10 %
" " for N. E. Hangers ... dis 65&10 %
Rakes.
Cast Steel ... dis 35 %
$8 00 9 00 10 00 11 00
8 10 12 14 teeth.
Malleable ... dis 40 %
$5 00 5 50 5 50 6 00 6 00 6 50
9 10 11 12 13 15 teeth.
Razor Straps.
Evan's ... dis 40 %
Imitation Emerson ... ℘ doz $2·75—dis 40&10 %
Hunt's ... dis 40&5 %
Chapman ... dis 10 @ 15 %
Torrey's ... dis 25 %
Saunder's ... net @ 10 %
Rivets.
Iron and Tinned ... dis 40 %
In bulk ... dis 30 %
Copper Rivets and Burrs ... dis 10 %
Nos. 7 8 9 10 11 12 13 14 15
Per lb. 49c 50c 52c 54c 56c 58c 60c 65c 70c
Rivet Sets ... dis 20 %
Road and Levee Scrapers.
Doty's Revolving ... dis 25 %
Rods.
Stair ... dis 50 %
" American Patent ... dis 33⅓ %
Rollers.
Barn Door ... revised list dis 65&10 %
Novelty ... dis 65&10 %
Acme (Anti-friction) ... dis 40 %
Rope. Manufacturers' List of May 4, 1877
Manila ... ⅝ inch and larger ℘ lb 14½c
" ... ⅜ inch ℘ lb 15 c
" ... ¼ and 5-16 inch ℘ lb 15½c
" Tar'd Rope ... ℘ lb 14 c
" Tar'd Lath Yarn ... ℘ lb 15½c
" Hay Rope ... ℘ lb 14½c
Sisal ... ⅝ inch and larger ℘ lb 11 c
" ... ⅜ inch ℘ lb 11½c
Sisal ... ¼ and 5-16 inch ℘ lb 12 c
" Hay Rope ... ℘ lb 11 c

Rules.	Boxwood.	Ivory.
Chapin's	dis 55&10 %	dis 45&10 %
Stanley	dis 55&10 %	dis 45&10 %
Standard	dis 55&10 %	dis 45&10 %
Stephens'	dis 55&10 %	dis 45&10 %
Willis, Thrall & Son	dis 55&10 %	dis 45&10 %

Sad Irons.
From 4 to 10 lbs ... ℘ lb 3 @ 3½c net
Sad Iron, Nickel Stand attached ... ℘ lb 9c
Self-Heating ... per doz $9·10 @ 9·25 net
" Tailors ... per doz $19·00 net
Mrs. Potts ... dis 20 %
Combined Fluter and Sad Iron ... per doz $15·00 dis 15 %
Sand Paper.
Baeder & Adamson's Flint, 00 to 1½ ... $4 25 ℘ ream }
" " " 2, 2½ & 3. 4 75 " }
" " " Assorted. 4 25 " } dis 15 %
" " Star ... ℘ ream $3 25 }
" " Emery ... ℘ ream $6 50 @ 11 50 }
New England, same list as B. & A. Flint ... dis 15 %
H. B. & M. Roman Flint " " " ... dis 15&5 %
Sash Cord.
Common ... ℘ lb 16 @ 18c. net
Patent ... ℘ lb 22½c. net
Silver Lake, Russia Flax ... ℘ lb 50c }
" " White Cotton ... ℘ lb 35c } net
" " Drab Cotton ... ℘ lb 40c }
Raw Hide ... dis 25 %
Sash Locks.
Clark's, Nos. 1, $10·00 No. 2, $8·00 per gross ... dis 40 %
Ferguson's ... dis 40 %
Norwich ... dis 25 %
Walker's ... dis 10 %
New England ... dis 20 %
Hammond's Window Springs ... dis 25 %
Sash Weights.—Solid Eyes ... ℘ lb 1½c
Sausage Stuffers or Fillers.
Miles ... ℘ doz $30—dis 30 %
Perry ... ℘ doz No. 11, $15; No. 10, $21—dis 30 %
Draw Cut No. 4 ... each $30 00—dis 20 %
Enterprise Mfg. Co ... dis 20 %
Silver's ... dis 25 %
Saw Frames ... per gross $18 00—dis 15&10 %
Saw Rods ... $10 list, dis 10&10 %
Saws.
Spear & Jackson's ... $3 50 to £ gold
Disston's Circular ... dis 25 %
" Mill ... dis 30 %
" Cross Cut ... dis 30 %
" Hand, Panel, Rip, &c ... dis 30 %
H. W. Peace's Circulars ... dis 25 %
" Mill, Gang and Mulay ... dis 25 %
" Cross Cut, Wood, Hand, &c ... dis 20 %
E. M. Boynton's Lightning, Cross Cuts ... dis 50&5 % }
" " One-Man, all lengths ... dis 40&5 % }
" " Buck Saws (X Bar). ℘ doz $15, dis 40&10 % } 2 % cash.
" " Billet Webs ... per doz $10, dis 40&5 % }
" " Pruning ... dis 40 % }
Wheeler & Clemson Mfg. Co.'s Band ... dis 15 %
" " " Cross-Cut ... dis 30 %
Livingston's Butcher and Kitchen ... dis 20 @ 25 %
Livingston's Framed Wood—
Nos. 101 102 103 104 105
Per doz $10·60 8·75 10·00 7·50 6·75 net
Saw Sets.
Boynton's Patent ... dis 40 %
Stillman's Genuine ... ℘ doz $4·25 net
" Imitation ... ℘ doz 3·25—dis 25 %
Common Lever ... per doz $2·00 dis 25 %
Leach's ... No. 0, $8·00; No. 1, $15·00 dis 15 %
Nash's ... No. 1, $8·50; No. 2, $5·50 dis 20&10 %
Hammer, Hotchkiss ... $5·50 dis 10 %
" Bemis & Call's ... dis 20 %
" Aiken's Genuine ... $12·00 dis 33⅓&10 %
" " Imitation ... $7·00 dis 25&10 %
" Hart's Patent Lever ... dis 20 %
Scales.
Hatch, Counter ... ℘ doz $36—dis 33⅓ %
" Tea ... ℘ doz $15—dis 40 %
Union Platform ... $6·00, $7·00—dis 40 %
Turnbull's ... dis 20 @ 25 %
Brown's ... dis 25&5 %
Fairbanks' ... dis 20&5 %
Howe's ... dis 20&5 %
Chatillon's Grocers' ... dis 25 %
" Eureka ... dis 20 %
Universal Family ... dis 25 %
Favorite Family ... dis 25 %
Scale Beams.
No. 1 300 to 1200 lbs ... 90c ℘ cwt } dis ... 40 %
No. 2 " " ... 75c ℘ cwt }
Scrapers.
Box, 1 Handle ... per doz $5·00, dis 10 %
" 2 " ... per doz 6·00, dis 10 %
Defiance Box and Ship ... dis 25&10 %
Foot ... dis 60 & 10 %
Ship (common) ... per doz $3 00 net
Ship—Providence Tool Co ... dis 10 %
Screw Drivers.
Hart, Bliven & Mead ... dis 55&10 %
Douglass Mfg. Co ... dis 25&10 %
" " No. 1 ... dis 30&10 %
Disston's ... dis 45 %
Stanley Rule & Level Co., No. 1 ... dis 25&10 %
" " " No. 2 ... dis 45&10 %
Screws.
Flat H'd Iron, list Sept. 1, '75, R.&E. Mfg. Co ... dis 60 %
" " " Am. Sc. Co ... dis 60 %
Round Head Iron " ... dis 50

Flat Head Brass, list Sept. 1, '75, Am. Sc. Co.....dis 55 %
Round Head Brass, list Sept. 1, '75, Am. Sc. Co...dis 40 %
Brass and Silver Capped, List March 1, '75.......dis 40 %
Lag or Common Coach, New List March 1, '76....dis 65 %
Coach, Patent Gimlet Point, List Jan. 1, 1875.dis 40 @ 50 %
Bed.......dis 10 %
Japanned, List of Plain Screws.......dis 35 %
Machine—Flat Head, Iron, Am. Screw Co.......dis 10 %
Round Head, Iron, " " ....net
Nettlefold's Brass.......dis 60 @ 60&5 %
Bench—Iron.......dis 60, 10&10 %
" —Wood, Beach.......₩ doz $3·00 net
" " Hickory.......dis 20&10 %
Hand.......dis 25&10 %
Hand Rail, Sargent's.......dis 55&10 %
" " Humason. Beckley & Co.'s.......dis 40&5 %
Jack—Bell Bottom.......dis 15 %

Scythes

Blood's German Steel, Grass....₩ doz $10 00 } dis $1·50 from list
" Cast " " ....₩ doz 11 00
" Silver " " ....₩ doz 12 00
" German " Grain ....₩ doz 14 00
" Cast " " ....₩ doz 15 00
Blood's Excelsior and Granger...₩ doz 11 00 } dis $1·50 from list.
" Young America.......10 50
" Silver Clipper.......13 00
Wadsworth's Grass.......dis 30 %
" Bush.......dis 20 %
Scythe Snaths.......dis 20 %

Shears and Scissors.

Cast Steel.......dis 75&10 %
Cast Iron.......dis 40 %
Seymour's Straight Trimmers.......dis 60&10 %
" Scissors.......dis 50 %
Pruning.......per doz $85·50 @ 6·00, net
Barnard's Lamp Trimmers.......per doz $3·75

Sheaves.

Sliding Door, M. W. & Co. list.......dis 35&2 %
" R. & E. list.......dis 50&5&2 %
" Patent Roller.......dis 25&2 %
" " Hatfield's.......dis 50&2 %
Russell's Anti-Friction.......dis 50&2 %
Sliding Shutter. R. & E. List.......dis 50&5&2 %
" " Sargent's List.......dis 55&10 %
Moore's Anti-friction.......dis 33⅓ %

Shovels and Spades.

Ames.......dis 30 %
Rowland's.......dis 50 %
Old Colony.......dis 30 %
Middleboro' Shovel Co.......dis 30 %
Remington's (Lowman's Patent).......dis 30 %
Dunning's Shovels and Scoops.......dis 20&7½ %

Shovels and Tongs.

Iron and Brass Head, R. & E. list.......dis 50&10&2 %
" " Hart's.......dis 55&2&10 %
Polished Steel.......dis 50&10&2 %

Slates.

Square Frames, Round Cornered, by case.......dis 70 %
Less than a case.......dis 65&10 %

Spokes.—North Carolina Handle Co.......dis 20 %

Spoke Shaves.

Defiance Metallic.......new list dis 25&10 %
Iron.......dis 33⅓&10 %
Wood.......dis 30 %
Bailey's.......dis 25&10 %

Spoke Trimmers.

Bonney's.......per doz $10·00 dis 40 %
Stearn's.......per doz $10·00 dis 40 %
Ives'.......No. 1, $15·00; No. 2, $12·00 ₩ doz, dis 33⅓&10 %
Douglass'.......per doz $9·00 dis 25&10 %

Spoons.

Tinned Iron.......dis 10 %
By the case.......dis 20 %
Basting.......dis 10 %
Britannia.......dis 55 @ 60 %
" Boardman's.......dis 55 %
Derby Silver Co.......dis 40&5 %
Rogers & Bro., A 1.......dis 40&5 %
Reed & Barton.......dis 40&5 %
Rogers Cutlery Co.......dis 50 %
Hall & Elton.......dis 40&5 %
Holmes, Booth & Haydens.......dis 40&5 %
Nickel Silver Co.......dis 30 %
German Silver (Hall & Elton).......dis 25&5 %
Tip (P. S. & W.)—
Teas.......$1·50 ₩ gross, net
Tables.......2·75 " net
Tin (Cowles Hdw. Co.).......dis 10 %
" " " case lots.......dis 20 %

Stencil Combinations.—Stafford Mfg. Co.—

Inch	½	¾	1	1¼	1½	2	2½
Per doz.	$6·00	6·50	7·00	9·00	10·00	12·00	18·00

Stocks and Dies........dis 5&10 %

Stone.

Hindostan Stone.......₩ ℔ 6c } dis 25&10 %
" Axe Stone.......₩ ℔ 8c
" Slips.......₩ ℔ 10c
Sand Stone.......₩ ℔ 6—dis 25&10 %
Washita Stone.......No. 1, ₩ ℔ 30c net
" ....No. 2, ₩ ℔ 25c net
" Slips.......No. 1, ₩ ℔ 60c net
Arkansas Stone.......No. 1, ₩ ℔ $1·35 net
" Slips.......No. 1, ₩ ℔ $2·50 net
Grindstones, Family, Loring's.......dis 10 %

Stove Polish.

Joseph Dixon's.......₩ gross, $6·00 dis 5 %
Gem.......₩ gross $4·50 dis 5 %
Gold Medal.......₩ gross $6 00 dis 25 %
Rising Sun.......per gross $5·75 net

Squares.

Steel.......dis 50 %; full cases, dis 50&10 %
Iron.......dis 50 %; full cases, dis 50&10 %
Nickel Plated.......add $2 50 @ $4 00 ₩ doz net
Try Squares and T Bevels.......dis 45&10 %
Star Try Squares and Bevels.......dis 35 %
Disston's Try Squares No. 1.......dis 30 %
" " No. 2.......dis 45 %
" " Improved. Nos. 1 & 2.......dis 30 %
Winterbottom's Try and Mitre.......dis 20&10 %

Tacks, Brads, &c.—List of January 1, 1876.

Tacks, Half Weight, American.......dis 75& } dis 10 % for cash
" Full " " ....dis 50&
" Half " Swedes.......dis 65&
" Full " " ....dis 30&
" Carpet, Am. and Swedes.......dis 10&
" " Leather Head.......dis 10&
" Copper.......₩ ℔ 45c. dis
Brads, Half Weight.......dis 50&
Shoe Nails—
4-8ths and longer, 9c.; 3½-8ths, 9½c. ₩ ℔, dis 10 %
Trunk, Clout and Finishing Nails—

½	⅝	¾	⅞	1	1⅛ in. and over.
23	19	17	13	13	11c. ₩ ℔, dis 10 %

Double Pointed Tacks.......dis 40&5 %

Tap Borers.

Common and Ring.......dis 25&10 %
Ives' Tap Borers.......dis 10&10 %
Enterprise Mfg. Co.......dis 20 %

Tapes, Measuring.

American Flask and Cap Co.......dis 20 %
Eddy's.......dis 20 %

Tea Trays.

American Tea Tray Co.......dis 15 %

Thermometers.

Tin Case.......dis 60&10 %

Tobacco Cutters.

Enterprise Mfg. Co. (Champion).......dis 20 %
Wood Bottom.......per doz $12—dis 30&10 %
All Iron.......per doz $17·50—dis 40&5 %
Nashua Lock Co.'s.......per doz $18 00—dis 50 %

Toe Calks.

Winsted.......₩ ℔ 10c., dis 5 @ 7½ %

Tinners' Tools and Machines.

P. S. & W.......dis 10 %

Traps.

Game, Newhouse.......dis 25&2 %
" Peck, Stow & Wilcox.......dis 60 %
" Hotckhiss.......old list dis 45 %
" Blake's Patent.......dis 40 %
Union Hardware Co.......dis 60 %
Mouse, Wood Choker.......₩ doz holes, 15 @ 16c
" Patent Choker (Union Nut Co.).......₩ doz holes 16 @ 18c net
" Round, Wire.......₩ doz $1 50 to 2 00 net
" Square, " ....₩ doz 2 00 to 2 50 net
" Cage.......₩ doz 2 50, dis 10 %
" Patent Self Setting.......per doz holes 25c net
" Catch-em-alive.......₩ doz $4·00 net

Trowels.

Lothrop's Brick and Plastering.......dis 10 %
Disston's Brick and Plastering.......dis 20 %
Peace's Plastering.......dis 20 %
Clement & Maynard's.......dis 20 %
Rose's Brick.......dis 5 %
Brades' Brick.......gold, dis 10 %
Worrall's Brick and Plastering.......dis 20 %
Garden.......dis 25 %

Triers.

Butter and Cheese.......dis 25 %

Ventilators (Window).

Nickel and Gilt.......per dozen $16·00 @ 18·00

Vises.

Solid Box, Trenton.......40 to 160 lbs., 12½c. net
" " Wilson's.......30 to 160 lbs., 18c } dis 33⅓ %
160 and over, 22c
" " Peter Wrights.......16c gold
Parallel, Parker's.......dis 20 %
" Wilson's.......dis 30&10 %
" Sargent's.......dis 35&10 %
" Trenton.......dis 20 %
" Backus and Union.......dis 25 %
" Merrill's.......dis 15 %
" Fisher & Norris.......dis 15&10 %
" Buffalo.......dis 25 %
" Stevens'.......dis 25 %
" Simpson's Adjustable.......dis 25 %
Saw Filers, Bonney's.......per doz $20·00 dis 25 %
" Stearn's.......per doz $20·00 dis 25 %
" Hopkins'.......per doz $17·50 dis 10 %

Wheel Barrows.

Canal (Pugsley & Chapman).......new list dis 30 %
Coal, Garden and Stone (Pugsley & Chapman)....dis 30 %
Jacob's Pat. Self-Oiling R. R. and Canal.......dis 25 %

Well Wheels.—Revised list.......dis 60&10 %

Wire.

Brass and Copper.......List of Jan. 1, 1877, dis 10 %
Bright and Annealed.......Nos. 0 @ 18 dis 52½ @ 55 %
" ....19 @ 26 dis 57½ @ 60 %
" ....27 @ 36 dis 60 @ 62½ %
Coppered.......0 @ 18 dis 47½ @ 50 %
Galvanized, Nos. 0 to 6.......₩ ℔ 8c net
Galvanized, Nos. 7 to 18.......market list dis 25 %
Tinned Nos. 0 to 18.......dis 33⅓ @ 35 %
Cast Steel.......dis 20 @ 25 %
Tinned Broom Wire, Nos. 18 to 25.......dis 42½ @ 45 %
Galvanized Telegraph, Nos. 8 and 9.......₩ ℔ 9c
Galvanized Telegraph, Nos. 10 and 11.......₩ ℔ 10c
" " 12.......₩ ℔ 10½c
Annealed Fence, Nos. 8 and 9.......dis 55 %
" Grape, " 10 to 14.......dis 55 %
Fence Staples.......₩ ℔ 7 @ 7½c
Fence Staples Galvanized.......₩ ℔ 10c
Stubs' Steel Wire.......$7 00 to 8 gold
Japanned Barb Fence.......₩ ℔ 15c
Galvanized " ....₩ ℔ 18c
Steel Music Wire, Nos. 12 to 27.......₩ ℔ 10c
Judd's Picture Wire.......dis 50 %
Clothes Line Wire, Galvanized.......per coil 45 @ 50c. net

Wrenches.

American Adjustable.......dis 45 %
Baxter's Adjustable "S" New List, May 1, '76....dis 20 %
" Diagonal " " ....dis 20 %
Collins & Co.'s.......dis 45 %

Coes' Genuine.......dis 50&5 %
Pattern (Wrought).......dis 50&10 %
(Malleable).......dis 75 %
Hull & Belden's "Climax".......dis 25 %
Knight's Patent.......dis 25 %
Lindsay's Patent.......dis 25 %
Taft's Pattern.......dis 75&10 %
Davis Patent Duplex.......new list dis 25 %
Bemis & Call's Patent Combination.......dis 20&5 %
" " Merrick's Pattern.......dis 25&2½ %
" " Brigg's Patent.......dis 20&5 %
Aiken's Pocket (Bright).......$8·00, dis 40 %

Wringers. Per doz.

Universal, without Cog Wheels.......$54·00
" with Cog Wh'ls, No. 2½, small fam'y size 63·00
" " No. 2, usual " 66·00
Crown No. 2.......57·00
" No. 3.......69·00
Climax No. 2.......$71·00 } Less $2·00 per doz. for cash before shipment.
" No. 1½.......79·00
XXX Universal No. 2.......71·00
" " No. 1½.......79·00
Household, no Cog Wheels.......54·00
Sherman, with " ....63·00
Eureka, no " ....60·00
Reliance, with " ....63·00
Novelty, No. 10, with Cog Wheels.......63·00
" No. 2, " " ....66·00
" No. 22, " " ....70·00
Excelsior, No. A, with folding bench.......84·00
" No. E, for set tubs.......72·00
Keystone No. 1, Wood Frame, no Gear.......56·00
" No. 2, Iron Frame, no Gear.......54·00
" No. 2½, Wood Frame, Purchase Gear.......66·00
" No. 3, Iron " " " ....63·00
" No. 10, Wood Frame, Common Gear.......63·00
Peerless, No. 2.......66·00
" No. 3.......71·00

Stamped Tin Ware.

Common Stamped Ware.......dis 20 %
Stamped Deep and Retinned Ware.......dis 33⅓ %
Japanned Tin Ware.......dis 5 %
Planished Tin Ware.......dis 20 %

METALS.

IRON.—DUTY: Bars, 1 to 1½ cents per lb., Sheet, Band, Hoop and Scroll, 1½ to 1¾ cents per lb. Provided, that none of the above Iron shall pay a less rate of duty than 35 per cent. Pig, $7 per ton; Polished Sheets, 3 cents per lb.; Wrought Scrap, $8 per ton; Cast Scrap, $6 per ton. Railroad, 70 cents per 100 lbs. Boiler and Plate, 1½ cents per lb.

Pig Iron—AMERICAN.

Foundry No. 1.......₩ ton, $18 00 @ 19 00
Foundry No. 2....... " 17 00 @ 18 00
Gray Forge....... " 16 00 @ 17 00

SCOTCH.

Glengarnock....... " 27 00
Eglinton....... " 25 00
Coltness....... " 28 50

Bar Iron.

Am. Refined, at mill.......2·10c @ 2·25c.

Rails.

Iron, at mill.......₩ ton $33 00 @ 36 00
Steel, " .... " 45 00 @ 47 00
Old Rails....... " 19 00

Scrap.

Wrought Scrap, from yard....... " 23 00 @ 24 00

Bar Iron from Store.

Common Iron.
⅜ to 2 in. round and square.... } ....₩ ℔ 2·1c
1 to 6 in. x ⅜ to 1 in.......
Refined Iron
⅜ to 2 in. round and square.... } ....₩ ℔ 2·3c
1 to 6 in. x ⅜ to 1 in.......
1 to 6 in. x ¼ and 5-16.......₩ ℔ 2·5c
Rods—⅜ and 11-16 round and square.......₩ ℔ 2·4c
Bands—1 to 6 x 12 to 3-16.......₩ ℔ 2·7c
Swedish Iron.
Ordinary sizes.......130 00 @ 132 50
Plow size.......

Sheet Iron.

	Common American.	R. G. American.
Nos. 10 to 20.......₩ ℔	3 @ 3½c	4 @ 4¼c
21 to 24....... "	3¼ @ 3½c	4¼ @ 4½c
25 to 26....... "	3½ @ 3¾c	4¾c
27....... "	3⅞c	5 c
28....... "	4 c	5¼c

Galvanized, 14 to 20, prime, ₩ ℔ 7½c; 2d quality ₩ ℔ 6 c
" 21 to 24 " " 8 c " ... " 6½c
" 25 to 26 " " 8½c " ... " 7 c
" 27 " " 9 c " ... " 7½c
" 28 " " 9½c " ... " 8 c
Patent Planished.......A, 11c.; B, 9½c. ₩ ℔
Russia, Nos. 8 to 16.......₩ ℔ 12 @ 12½c
" Stained, No. 1....... " 11½ @ 12c
Am. Cold Rolled....... " 4½c
One piece Corrugated Sheet Iron Elbows.

CHARCOAL IRON.

¼	5	5½	6	7 inch.
$2·50	3·50	4·50	5·25	6·50 per doz.

RUSSIA IRON.

4½	5	5½	6	7 inch.
$5·00	7·00	9·50	12·00	14·00 per doz.

COPPER—DUTY. Pig, Bar and Ingot 5c.; old copper, 4 cents ₩ ℔; Manufactured (including all articles of which copper is a component of chief value) 45 % ad valorem.
American Ingot.......₩ ℔ 20 @ 20½c
English.......

SHEATHING, BRAZIERS COPPER, BOLTS, &C.

Braziers Copper, ordinary sizes, over 16 oz., per square foot.......32c ₩ ℔
Braziers Copper, ordinary sizes, 16 oz. and over 12 oz., per square foot.......34c. "
Braziers' Copper, 12 oz. per square foot.......36c. "
Circles less than 84 inch in diameter.......35c "
Circles, 84 inch diameter and over.......38c. "
Segment and Pattern Sheets.......35c. "
Locomotive Fire Box Sheets.......32c. "
Sheathing Copper, over 12 oz. per sq. ft.......31c. "
" " 12 oz. ₩ sq. ft. and lighter.......36c. "
Bolt Copper.......31c. "
Copper Bottoms, 32c. ₩ ℔.......net
No Copper is Sheathing except 14x48 inches, and not to exceed 34 oz. to the square foot.
Sheathing Copper, tinned on one side, by the case.......6c. ₩ sheet
For less than a case.......8c ₩ sheet
Tinning Sheets, ordinary sizes.......2½c. ₩ sq. ft
For tinning both sides double the above amount.

O'NEILL'S PATENT PLANISHED COPPER.

14x48.

14 and 16 oz. and heavier.......37c. By the case, 36c. ₩ ℔
12 oz. and lighter.......40c. " " 39c. "

Boiler Sizes.

7 in., 14x52. 8 in., 14x56. 9 in., 14x60
14 and 16 oz. and heavier.......39c. By the case, 38c. ₩ ℔
(And all sizes not over 20 inches wide.)

30x60

14 and 16 oz. and heavier.......41c. ₩ ℔
12 oz.......44c. "

Brass.

Brown & Sharp's Gauge the Standard for Metal; Old English Gauge the Standard for Wire.

BRASS MANUFACTURERS' PRICE LIST.

January 1, 1877.

Cash prices for Roll and Sheet Brass. For less quantity than 100 pounds, add 3 cents per pound.

HIGH BRASS

All Nos. not thinner than to No. 28, wider than 2 in., not wider than 14 in.......30c.
All Nos. to No. 28, inclusive, and widths over 14 to 20 in., inclusive.......34c
All Nos. to No. 28, inclusive, and widths over 20 to 30 in. inclusive.......37c
½c. ₩ ℔ advance on each No. above Nos. 28 to 38, inclusive.
All Brass thinner than No. 38 is Platers' Brass, at.......50c
Sheets 24x48 in., and all sheets cut to particular sizes and lengths under 30 in., in width wider than 2 in...37c
Printers' Rules.......44c
Sheets wider than 30 in. and under 40 in.......45c
" " " 40 in. and over.......47c
Circular sheets, in diam. from 4 in. to 14, inclusive....41c
" " " over 14 " 20, " 45c
" " " " 20 " 30, " 48c
" " " " 30 " 40, " 51c
" " " " 40 in.......54c

LOW BRASS.

Four cents ₩ ℔ more than High Brass.
Gilding Metal 6c, ₩ ℔ more than High Brass.
Platers' or Gold Metal } In Bars.......46c
} Sawed.......49c
} Planed or Polished.......52c

FOR SLITTING.

Metal in width 2 in. to ½ in. to No. 28, inclusive, per ℔. advance.
Metal, in width 2 in. to 1 in., thinner than No. 28, 2c. per ℔. advance.
Metal, in width 1 in. to ½ thinner than No. 28, 3c. per ℔. advance.
Metal, in width ½ in. to ¼, inclusive, not thinner than No. 28, 2c. per ℔. advance.
Metal, in width ½ in. to ¼ thinner than No. 28, 5c. per ℔. advance.
Metal, ¼ in. in width and less, 10c. per lb. advance
Any of the above widths cut to particular lengths, add 7c. per pound.

GERMAN SILVER MARKET METAL AND WIRE.

	Market Metal.	Wire.
4 per cent., 12 in., to No. 26.......	$0·60	$0·85
6 " " "	·68	·95
10 " " "	·84	1·15
15 " " "	1·04	1·40
18 " " "	1·16	1·55

German Silver Sheets over 12 in. wide, and weighing more than 16 ℔s., $2·25 per ℔.
Advance 2c. for each additional in., in width above 12 in., and 2c. per ℔. on each No. thinner than Nos. 26 to 36 inclusive.
All German Silver thinner than No. 36 is Platers' at 50c. per ℔. additional.
German Silver Scrap one-third less than net price of 12 in. Market Metal. German Silver Turnings, Filings and Chips, half the price of Scrap.

BRASS AND COPPER WIRE.

	High Brass.	Low Brass.	Gild'g and Cop'r.
No. 0 to 20.......	$0·34	$0·38	$0·45
No. 21.......	·35	·39	·46
No. 22.......	·36	·40	·47
No. 23.......	·37	·41	·48
No. 24.......	·39	·43	·50
No. 25.......	·42	·46	·53
No. 26.......	·44	·48	·55
No. 27.......	·46	·50	·57
No. 28.......	·49	·53	·60
No. 29.......	·52	·56	·63
No. 30.......	·55	·59	·69
No. 31.......	·59	·63	·75
No. 32.......	·63	·67	·81
No. 33.......	·67	·71	·90
No. 34.......	·71	·75	1·00

Spring Wire 3c. per ℔. advance.
Flat, Square and Half Round Wire, 5c. per ℔ advance on Round Wire.

Fancy Wire not less than 10c. per ℔. advance of Round Wire.
Brass Rods, No. 8 and smaller not less than 2 feet lengths, 45c.
Wire straightened and cut, smaller than No. 8, and not less than 2 feet lengths, 40c.
Wire and Rods less than 2 feet lengths, special rates.
Twelve cents per ℔. extra for spooling on 1 ℔. spools.

MISCELLANEOUS.

Common Plain Brass Pail Ears.......$0 44
Brass Door Rail.......·45

SCRAP.

High Brass Scrap, 16 cents.
Low " 18 cents.
Gilding, 20 cents.
Turnings, Filings and Chips the price of Scrap.
Terms—Net cash. Interest be added after thirty days.

TUBING.

₩ ℔
Plain to No. 20 inclusive, above ⅛ in. to 3 in.......$0·40
" above 3 in.......·50
Nos. 21, 22, 23, two cents advance on List for each Number.
Nos. 24, 25, 26, four cents advance on List for each Number.
Above No. 26 special rates.
Plain ¼ inch.......·78
" 3-16 " ....1·10
" ⅛ " ....1·60
All Mandrel Drawn Tubes, 5 cents advance on List Prices.
Fancy Tubing to No. 20.......48c
English, Scotch and Extra Patterns Fancy Tubing to No. 20.......53c
Tubing Sawed or Cut 2 to 4 feet long, 2 cents advance on List.
Add to 2 cents ½ cent for each additional cutting under two feet.
All Mandrel Drawn Tubes under ⅜ in., 25 cents per pound advance.

ZINC TUBING.

Plain.......·28
Fancy.......·31
Scotch and Extra Patterns.......·34

GERMAN SILVER TUBING

4 Per cent.......·86
6 " ....·95
9 " ....1·10
12 " ....1·25
15 " ....1·40
16 " ....1·45
18 " ....1·55
20 " ....1·56

STEEL.—DUTY: Bars, Ingots, Sheets and Coils, valued at 7 cents per lb., or under, 2¼ cents; over 7 cents, and not above 11, 3 cents per lb. over 11, 3½ cents per lb. and 10 % ad val. Railway Bars 1¼ cents per lb. Railway Bars, in part Steel, 1 cent per lb. Provided, that Metal cemented, cast or made from iron by the Bessemer or pneumatic process, of whatever form or description, shall be classed as

American Cast Steel.

Tool.......15 @ 16c
Spring.......10c
Homogeneous.......12½c
Tire.......12½ @ 13½c
Machinery (round and square).......10 @ 11c
File.......11c
Sheet.......14 @ 16c
Saw Plate, mill and mulay.......14 @ 16½c
Saw Plate, gang and X cut.......13 @ 14c
" circular as to size.......18 @ 30c

Chrome Steel.

Tool.......₩ ℔ 20 @ 21c
Tool, extra fine....... " 40 @ 75c
Spring.......₩ ℔ 12c and upward
Machinery.......₩ ℔ 14c
Hammer....... " 15c,
Gun or Homogeneous....... " 16c

English Steel.—payable in gold, net.

" Best Cast.......₩ ℔ 17½c
" Extra Cast....... " 18½c
" Round Machinery, Cast.......₩ ℔ 10½ @ 11½c
" Swaged, Cast....... " 19½c
" Best Double Shear....... " 17½c
" Blister, 1st quality....... " 14½c
" " 2d quality....... " 13 c
German Steel, Best....... " 11½c
do 2d quality....... " 10½c
" 3d quality....... " 9½c
Sheet Cast Steel, 1st quality....... " 17½c
" " 2d quality....... " 14½c
" " 3d quality....... " 12½c
File Steel, Flat and ½ Round....... " 12½c
" Square and Round....... " 13½c
" Mill....... " 13½c
" Taper to 4 inch....... " 16c
" Taper 3 and 3½ inch....... " 18c

ANTIMONY.......13½ @ 14c currency

LEAD—DUTY: Pig $2 per 100 lbs.; old Lead, 1½ cent per lb.; Pipe and Sheet, 2½ cents per lb.
Spanish.......6½ @ 6¾c gold
German Refined.......6¾c gold
English.......6¾ @ 7c gold
American.......6¼ @ 6½c currency
Bar.......dis 10 %.......7½c.
Pipe.......dis 10 %.......9c.
Tin Lined Pipe.......dis 10 %.......16½c.
Sheet.......dis 10 %.......9½c.
Shot.......dis 10 %.Drop, 9½c. Buck, 10½c.

BABBITT METAL.

N. P. U.......₩ ℔ 8½ @ 9c
A., 25c.; B, 20c.; C, 15c.; D, 12c. ₩ ℔.

SOLDER.......No. 1, 12 @ 12½c.; No. 2, 11½@12c

SPELTER—DUTY: In Pigs, Bars and Plates $1 50 per 100 lbs.
Silesian, cash.......6½ @ 7c., gold
American ".......6½ to 6¾c
Lehigh, on spot.......11c

TIN—DUTY: Plates, Sheets, Tagger and Terne, 1·1c. per lb.; Electro-galvanized Plates, 2 cents per ℔; Manufactures of, not enumerated, 35 per cent. ad val. Bars, Block and Pigs free. Banca, subject to duty of 10 per cent.
Banca.......₩ ℔ 21 @ 22c., currency
Straits.......₩ ℔ 18½ @ 19c., currency
English.......₩ ℔ 18 @ 19c., currency

TIN PLATES, CURRENCY PRICES.

I C 10x14 } Prime Charcoal.......$7·50
12x12
14x20
I X 10x14 } Prime Charcoal.......$9·75
12x12
14x20
D C 12½x17 ".......7·00
D X 12½x17 ".......9·75
For each additional X add.......2·25

COKE TIN PLATE.

	Best.	2d quality.	Ordinary.
I C 10x14 } I C 12x12 } I C 14x20 }.......	7·00	6·75	6·25 @ 6·50

TERNE PLATE.

	Prime Char.	2d qual.	Coke.
I C 14x20....	$6·50@6·75	6·25	5·75 @ 6·00
I X 14x20....	8·75		
I C 20x28....	13·50@14·00	12·00 @ 13·50	12·00 @ 13·00
I X 20x28....	19·50		
I C 20x28....	21·75		
I C 14x20 M. F. Brand.......			$7·75 @ 8·00

ZINC.—DUTY Pig or Block, $1 50 per 100 lbs. Sheet 2½c. ₩ ℔.
Sheet.......cask 7 @ 7¼c
".......7¼ @ 7¾c

Paper Stock, Old Metals, &c

(Dealers' Selling Price.)

Canvas linen.......5¾ @ 6¼
" cotton, No. 1....... @ 3½
" " No. ....
White linen rags, No. 1.......5½
" " No. 2.......3¾ @ 4
Colored.......2¼ @
Mixed woolens.......2½ @ 3¼
Soft woolens.......7 @
Gunny bagging.......3 @ 2¼
Jute Butts.......2¼ @ 2¾
Kentucky bagging.......5 @
Waste paper and scraps.......1 @ 1½
Rope cuttings.......1½ @ 3
Kentucky Bale rope.......4 @ 4½
Oakum junk, No. 1.......5½ @ 5¾
" No. 2....... @ 4
Grass rope.......3¾ @
Tarred Shaking.......2
White Collar Cuttings, all paper.......7 @
" " " muslin lined.......5 @
" " Envelope.......7 @
Hard White Shavings, No. 1.......5¾ @
Soft " " No. 1.......4¾ @ 4½
White Shavings, No. 2.......4½ @ 4¾
Mixed Shavings, part white.......3¾ @ 4
Imperfections, No. 2, best folded sheets.......4¾ @
" 1, Heavy Stock.......4¾ @
Book Stock, Mixed.......3¾ @
" " No. 2, light.......2 @
Newspaper Stock.......2¾
Prints.......1¾ @ 2
Pure Manilas.......2¾ @ 2½
Bogus Manilas and Hardwares.......1 @ 1¼
Commons.......1 @
Binders' Board Cuttings.......1¾ @
Straw Board Cuttings.......1¾ @
Woolen Tailor Clips.......13 @ 14
Satinet Tailor Clips.......2 @ 2½

Old Metal.

Copper.......16½ @ 17
Yellow metal.......13 @
Brass light.......9½
Brass, heavy.......11
Heavy Composition.......14
Old lead, solid.......5
Tea lead.......4¾
Zinc....... @ 4½
Pewter, No. 1.......15
" No. 2.......9 @ 10
Spelter....... @ 6¾
Wrought Iron.......per ton $20·00
Machinery Iron.......per ton $18·00
Light Iron.......per ton $12·00
Stove plate.......per ton $10·00
Burnt Iron.......per ton $5·00

Paints, Oils, &c.

Paints.

Black lamp—Coach Painters.......₩ ℔ 20c
" " Ordinary.......6c
" Ivory Drop, fair.......15c
" " best.......23c
Black Paint, in oil.......kegs, 8c.; ass't'd cans, 11c
Blue, Prussian, fair to best.......40 @ 50c
" " " " in oil.......25 @ 55c
" Chinese dry.......85c
" Ultamarine.......18 @ 30c
Brown, Spanish.......1½c
" Van Dyke.......9c
Carmine, 40.......combination price
Green, Chrome.......15 @ 25c
" " in oil.......18 @ 25c
" Paris.......good, 33c; best, 40c
" " in oil.......33c " 45c
Mineral Paints.......1½ @ 4c
Orange Mineral.......14c
Red Lead, American.......8½c
" " English.......10½
" Venetian (N. C.) dry.......2c
" " in oil.......ass't'd cans, 11c; kegs, 8½c
" Indian, dry.......10c
Rose Pink.......10 @ 13c
Sienna, American, Raw.......4c
" Burnt.......4½c
" " in oil.......16 @ 20c
" Raw " ....15 @ 25c
Umber, Burnt.......4 @ 8c
" " in oil.......16 @ 21c
" Raw.......3½ @ 7½c
" in oil.......16 @ 22c
Vermillion, Chinese.......1 00, gold
" English.......72½c, gold
" Trieste.......1 10 "
" American, Common.......18c
White Lead, American, pure dry.......9½c
" " in oil.......10c
White, Paris, English, prime.......in bbls. 2½ @ 2¾c
Yellow Ochre, French.......1 75
" " in oil.......ass't'd cans, 11c; kegs, 8c
" " Vermont.......in casks 1¼c
Yellow Chrome.......17 @ 27c
" " in oil.......18 @ 28c
Zinc White, American No. 1 dry.......9c
" " 1, in oil.......11c
" French (Paris).......11c
" " in oil.......13c

Oils.

Linseed Raw.......₩ gal. casks. 75c. bbl., 76c
" Boiled....... " 80c. " 81c
Whale, Crude.......
" Bleached Winter.......73c
Sperm, Crude....... " 1·60
" Winter unbleached....... " 1·65
" " Bleached....... " 1·75
Seal, Extra Refined....... "
Lard, Pure Winter....... " 90c
" Spring....... " 90c
Cotton Seed, Crude....... " 62c
" Southern Yellow....... " 67c
" White....... "
Neatsfoot, Winter.......70c @ $1·10
Natural Lubricating.......38c @ 40c

Sundries.

Asphaltum.......6c
Benzine.......₩ gal. 16c
Chalk.......¾c
" Block.......
Dryer, Patent, Am'n.......ass't cans, 10½c.; keg 9c
" " English....... " 11c.; " 9c
Flocks.......
Frostings.......50c
Glue, White.......23 @ 44c
" Sheet.......
Glaziers' Points, Zinc.......
Gum, Copal.......36c
" Damar.......25c
" Shellac, English.......45c
" " " dark.......40c
Litharge.......9½c
Pumice Stone, selected Lumps.......4 @ 5c
" powdered.......2½c
Putty in bladders.......2½c
" in bulk.......2½c
Rotten Stone, soft, English.......8c
Spirits Turpentine.......33c
Whiting, Spanish.......¾c

Glass

FRENCH WINDOW GLASS.

Prices current per box of 50 feet.

Single Thick.—Discount 60 %.

SIZES.	1st.	2d.	3d.	4th.
6 x 8 to 10 x 15.......	$7·50	$6·75	$6·25	5·75
11 x 14 to 16 x 24.......	8·50	7·75	7·25	6·50
18 x 22 to 20 x 30.......	10·75	9·75	8·75	7·75
15 x 36 to 24 x 30.......	12·25	10·75	9·00	
26 x 28 to 24 x 36.......	13·00	11·50	9·75	
26 x 36 to 26 x 44.......	14·50	13·25	10·75	
26 x 46 to 30 x 50.......	15·00	14·00	11·25	
30 x 52 to 30 x 54.......	16·00	14·50	12·00	
30 x 56 to 34 x 56.......	17·25	15·50	14·50	
34 x 58 to 34 x 60.......	18·25	17·25	15·00	
36 x 60 to 40 x 60.......	20·75	18·75	17·25	

Double Thick.—Discount 60&10 %.

SIZES.	1st.	2d.	3d.	4th
6 x 8 to 10 x 15.......	$12·00	$11·00	$10·00	$9·25
11 x 14 to 16 x 24.......	13·75	12·50	11·75	10·50
18 x 22 to 20 x 30.......	17·25	15·75	14·00	
15 x 36 to 24 x 30.......	19·75	17·25	14·50	
26 x 28 to 24 x 36.......	21·00	18·50	15·75	
26 x 36 to 26 x 44.......	23·25	21·25	17·25	
26 x 46 to 30 x 50.......	24·00	22·50	18·00	
30 x 52 to 30 x 54.......	25·75	23·25	19·25	
30 x 56 to 34 x 56.......	27·75	25·00	21·75	
34 x 58 to 34 x 60.......	29·25	27·75	24·00	
36 x 60 to 40 x 60.......	33·25	30·00	27·75	

Sizes above 40 x 60—$10·00 per box extra for every five inches.
An additional 10 per cent. will be charged for all Glass more than 40 inches wide. All sizes above 52 inches in length, and not making more than 81 united inches, will be charged in the 84 united inches bracket.

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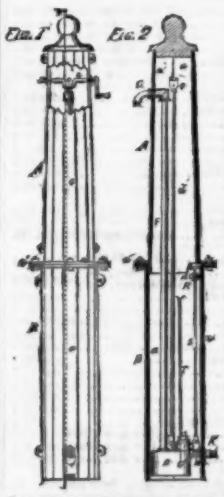

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BUTCHERS' STEELS,
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German and English Hardware, Cutlery, Guns, Gun Material, Chains, Heavy Goods.

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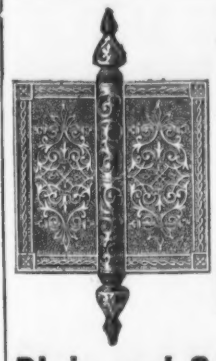
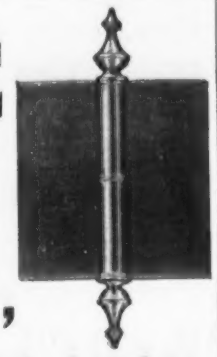


BLAKE BROS.
Hardware Co.,



MANUFACTURERS OF

Plain and Ornamental Butts, Thumb Latches,

STORE DOOR HANDLES,

Single or Double Handle, Reversible Mortise Latch,
Patented January 9, 1877.

Oilable Axle Pulleys,
Patented October 10, 1876.

KEY ESCUTCHEONS that keep the Key in the Lock,
Patented February 2, 1875.

CORK EXTRACTORS, NUT CRACKERS,
And a large line of

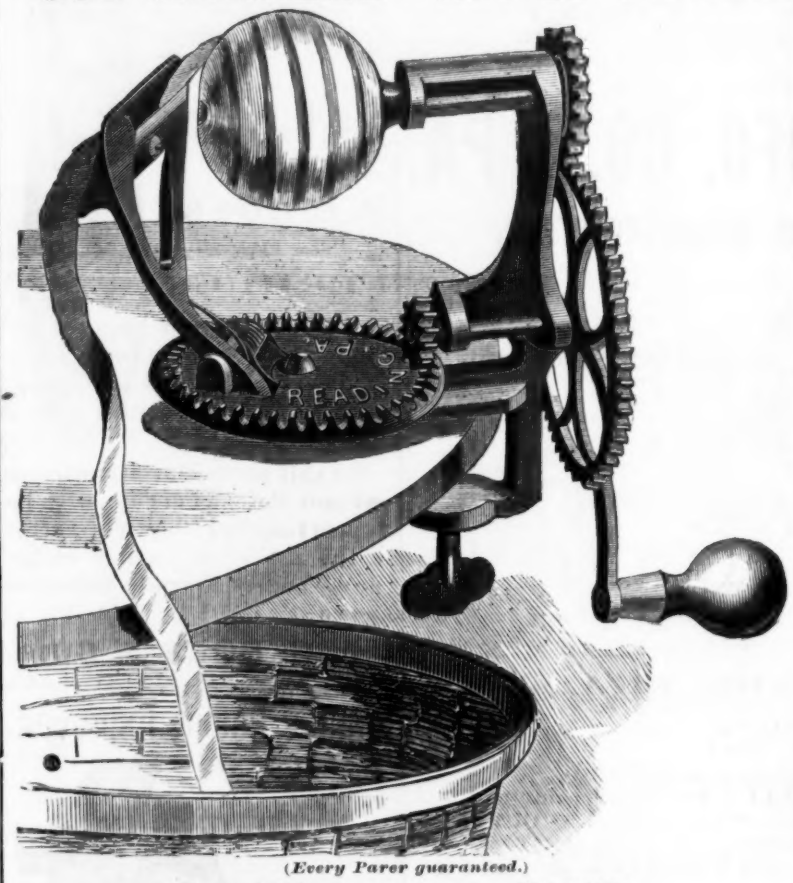
BUILDERS' HARDWARE.

OFFICE, 85 Orange Street, New Haven, Ct.
FACTORIES, Westville, Ct.

AGENCIES:

Geo. H. Gray & Danforth, 48 India St., Boston, Mass.
Wm. A. Dodge, 96 Chambers Street, New York.
S. T. Latham & Co., 417 Commerce Street, Philadelphia, Pa.
Focke & Co., 12 German Street, Baltimore, Md.

READING BUTT WORKS.
RICK BROTHERS.
"OLD RELIABLE" APPLE PARER.



(Every Parer guaranteed.)

Price, per single dozen ..... **$5.00.**
Packed one dozen in a box.

New York Warerooms, 103 Chambers Street. **E. E. YATES & CO., Agents.**

NORTHWESTERN HORSE NAIL CO.
ESTABLISHED IN 1862.

HAMMERED AND FINISHED HORSE NAILS.

We offer our Finished Nail to the trade with the confidence that it has no equal in the market. It is the genuine "Northwestern" Nail, Finished, and we give it our unqualified guaranty.

Office and Factory, 56 to 68 Van Buren st., Chicago.

A. W. KINGSLAND, Secretary.

GLOBE NAIL COMPANY,
MANUFACTURERS OF

Pointed Polished & Finished Horse Shoe Nails.

Recommended by over 20,000 Horse Shoers.

All nails made from best NORWAY IRON, and warranted perfect and ready for driving. Orders filled promptly and at lowest rates by

GLOBE NAIL CO., Boston, Mass.

THE FOWLER NAIL CO.,
SEYMOUR, CONN., Manufacturers of

THE VULCAN HORSE SHOE NAIL
POINTED READY FOR DRIVING.

Emery, Grindstones, &c.

Walter R. Wood,
GRINDSTONES.
SOLE AGENT OF THE

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NOVA SCOTIA and other brands.

283 & 285 Front Street, New York.

WORTHINGTON & SONS,
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Manufacturers of

Lake Huron Amherst and Berea
GRINDSTONES.

A. F. PIKE.
East Haverhill, New Hampshire,

Manufacturer and Wholesale Dealer in

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STONES.

LETOILE,
UNION,
PREMIUM,
DIAMOND GRIT,
WHITE MOUNTAIN,
INDIAN POND (red ends)

Stones gotten up or labeled in any style desired. Price and quality guaranteed.

Our Stone are of good keen grit and *will not glaze.*

Steam Oil Stone Works.
F. E. DISHMAN,
Successor to WM. GALBRAITH & Co.

Manufacturer of and Dealer in the Best

Washita, Arkansas, Hindostan and Sand

STONES,
☞ Of various sizes and patterns, suited to every variety of Mechanical use. **New Albany, Ind.**
Send for price list.

BOYD & CHASE,
The largest manufacture in the world of

OIL  STONE

Of all description.

107th Street and Harlem River,
Send for Price List. **NEW YORK.**

Coal.

A. PARDEE, Hazelton, Pa. J. G. FELL, Nat'l

A. PARDEE & CO
303 Walnut St.,
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MINERS AND SHIPPERS OF

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The following superior and well known Lehigh Coals are mined by ourselves and firms connected with us, viz.

A. Pardee & Co. { HAZLETON, CRANBERRY, SUGAR LOAF.
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ROBERT HARE POWEL & CO.
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Sole Proprietors, Miners & Shippers of the celebrated

POWELTON
SEMI-BITUMINOUS
COALS.

THE BEST & CHEAPEST

In the market for the use of Ocean Steamers, Tugs Steamboats and Locomotives, Stationary Engines, Steel Makers, Rolling Mills, Puddling Furnaces, Glass Manufacturers, Blacksmithing, Brick and Lime Burning, and General Industrial Purposes.

These coals can be delivered to all points reached by railroad or navigation.

Lehigh Valley Coal Co.,
MINERS AND SHIPPERS OF

Lehigh, Wyoming White & Red Ash
(BALTIMORE VEIN.)

Office, cor. Cortlandt & Church Sts.
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GEORGE S. NEWTON, Agent. Shipments by Railroad and Morris Canal direct from the mines, and from Perth Amboy and Jersey City, for all Points.

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Dealers in

SCRANTON, LEHIGH and other COALS.

Retail Yard on D. L. & W. Railroad, cor. Grove and 19th Sts., Jersey City. Coal delivered direct from Shutes to Carts and Wagons. Families and manufactories supplied with the best qualities of Coal at the lowest rates.

OFFICES: At Yard cor. Grove and 19th Sts.; cor. Bay 84. and Newark Ave., Jersey City; Room 35, 111 Broadway, N. Y. Uptown Office, Bank Building, cor. Newark and Hudson Sts., Hoboken. P. O. Box 24, Hoboken.

WHEELING HINGE CO.,

Wheeling, West Va.,

Manufacturers of

Wrought Butts, Strap & T Hinges, Wrought Hooks, Hasps & Staples, Wrought Repair Links & Washers,

GRAHAM & HAINES, Sole Agents, 113 Chambers & 95 Reade Sts., N. Y.

QUACKENBUSH, TOWNSEND & CO.,

Hardware, Cutlery, &c.

85 Chambers & 67 Reade Sts., N. Y.

Depot for THOS. JOWITT & SONS, (Sheffield, England,) FILES and HORSE RASPS.

Rough & Ready And CLIPPER SCYTHES, Warranted.

Manufacturers of the

Patented March 4, 1873.

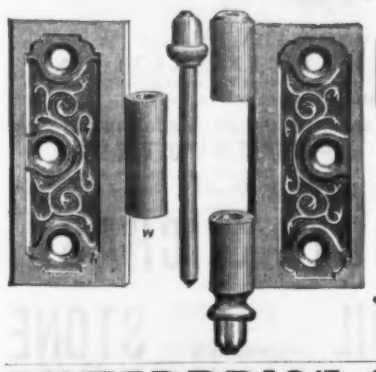
Agents for Norwich Lock MFG. CO.

"BEAVER" American) FILES and HORSE RASPS.

"WIDE AWAKE" AXES.

CLARK & CO.,

MANUFACTURERS OF



BUILDERS' HARDWARE.

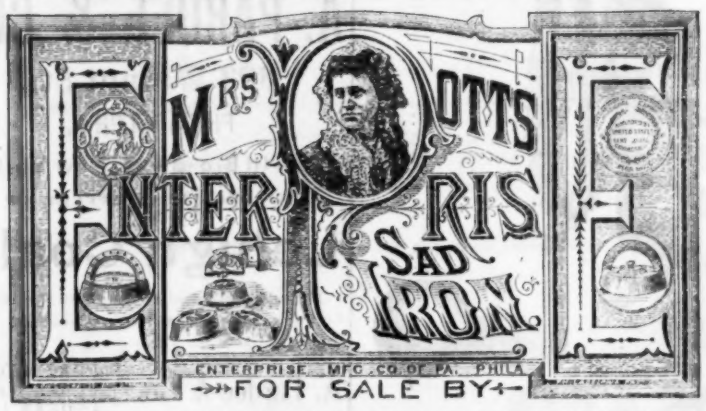
426 & 428 Niagara Street, BUFFALO, N. Y

J. CLARK WILSON & CO., Agents, *81 Beekman St., New York.*

Send for Catalogue and Price List.

ENTERPRISE MFG. CO. of PA.

Patented Hardware Manufacturers.



THE HARDWARE TRADE.

MRS. POTTS' COLD HANDLE IRONS,
COFFEE, SPICE AND DRUG MILLS,
CORK PRESSERS, SAUSAGE STUFFERS,
FRUIT LARD & JELLY PRESSES combined,
MEASURING FAUCETS, TOBACCO CUTTERS,
SELF-WEIGHING CHEESE KNIVES,
BUNG HOLE BORERS, &c., &c., &c.

S. W. Corner American and Dauphin Sts.,

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CHALFANT MFG. CO.

The Original Makers of the Mrs. Potts' Cold Handle Sad Iron.

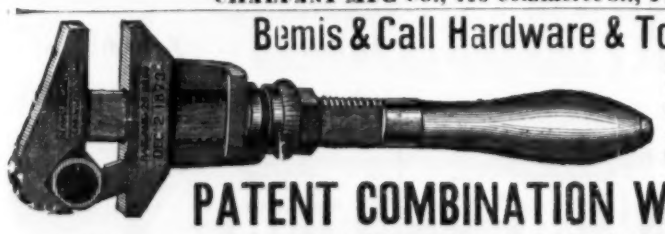
To the Trade: We call attention to the great **IMPROVEMENT** recently perfected by us in

The Mrs. Potts' Cold-Handle Sad Iron.

To avoid the various objections made to the so-called "non-conducting filling"—which, it is complained, causes the iron to be longer in heating, works over on the goods when in use, and takes up moisture and produces rust when not in use—we employ an air chamber below the handle. This air chamber prevents the heat of the iron, in great measure, from working up to the handle, and also keeps the cold exterior air from striking the interior of the iron and cooling the latter too rapidly. With this new improvement, of which we have exclusive control, we are able to offer to the trade an **absolutely perfect Sad Iron**—one which will heat rapidly, but cool slowly, which contains no material to injure fabrics, which takes up no moisture when not in use, and which, when using, conveys no uncomfortable heat to the handle or hand of the ironer. This is the best and cheapest Mrs. Potts' Patent Cold Handle Sad Iron in the market. Send for Price Current.

CHALFANT MFG CO., 415 Commerce St., Philadelphia.

Bemis & Call Hardware & Tool Co.



This Wrench can be furnished with Briggs' Pat. Nut or Sleeve.

PATENT COMBINATION WRENCH.

These Wrenches are made from the best of Wrought Iron, with Steel Head and Jaw, Case-Hardened throughout, and not only combine all of the superior qualities of our cylinder or Gas Pipe Wrenches, but also all requisite Combinations of a regular Nut Wrench, thus making a Combination which has no equal.

For Circulars and Price List, address,

BEMIS & CALL HARDWARE & TOOL CO. Springfield, Mass.

METALLIC SIEVES.

Protected by 14 patents.

MANN'S PATENT.

Best Sieve known, Cheap, Neat and Durable.

ADAMS & WESTLAKE MFG. CO., CHICAGO, ILLS.

GRANT & CO., Newark, N. J.

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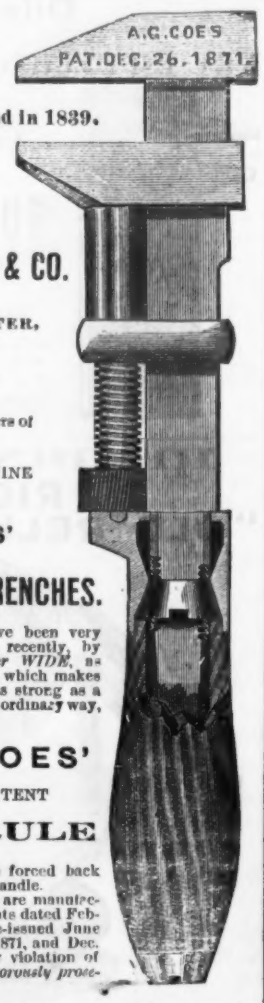


Established in 1839.

A. G. COES & CO.

WORCESTER, Mass.,

Manufacturers of

THE GENUINE

COES'

SCREW WRENCHES.

Our goods have been very much improved recently, by making the *Bar WIDE*, as shown in the cut, which makes a 12 in. Wrench as strong as a 15 in. made in the ordinary way, and by using

A. G. COES'

NEW PATENT

FERRULE

Which cannot be forced back into the handle.

☞ Our goods are manufactured under Patents dated February 7, 1860, (re-issued June 29, 1871), May 2, 1871, and Dec. 26, 1871, and any violation of either will be *vigorously prosecuted.*

We call particular attention to our new Patent Ferrule, with its Supporting Nut (shown in section in the above cut), which makes the strongest Ferrule fastening known.

A. G. COES & CO.

Smith's Patent Improved.

THE BEST ADJUSTABLE HOLLOW AUGER MADE.

E. M. BIRDSALL & Co., Pen Yan, N. Y., write:

"The Tenon Auger, which you sent us on approval, we have fully and severely tested. It is the best tool for the purpose which we have seen or used."

CHAS. M. GHRISKEY,

Manufacturers' Agent,

508 Commerce Street, Philadelphia, Pa.

"I Rise to remark."

GOLD MEDAL.

A PERFECT MANGLE *FOUND AT LAST.*

Baldwin's Steam Mangle,

Hotels, Asylums, Laundries.

Families See Circulars.

Standard Laundry Machine Co., Boston & New York.

COBB & DREW,

Plymouth, Mass.

Manufacturers of Copper, Brass, and Iron Rivets; Common and Swedes Iron, Leathered, Carpet, Lace and Glimp Tacks; Finishing, Hungarian, Trunk Clout and Clasp Box Nails, &c. Rivets made to Order.

NEW YORK AGENCY

George C. Grundy, HARDWARE.

165 Greenwich Street.

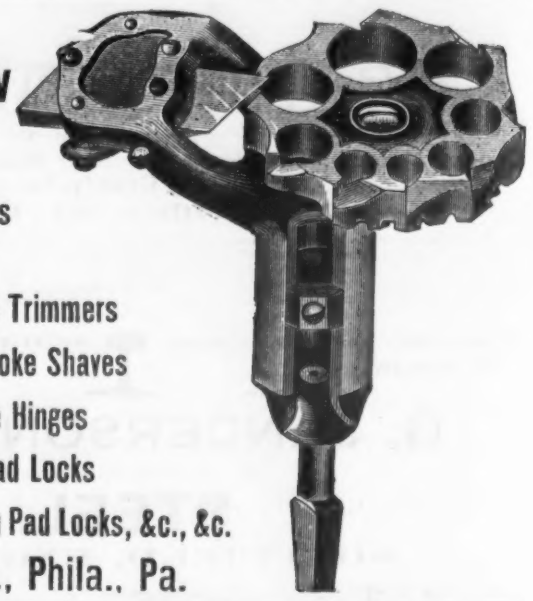
Agent for the Philadelphia Star Carriage and Tire Bolts.

Lloyd, Supplee & Walton,

HARDWARE FACTORS.

MANUFACTURERS OF

Bonney's Hollow AUGERS.



Stearn's Hollow Augers and Saw Vises

Bonney's Spoke Trimmers

Double Edge Spoke Shaves

Adjustable Gate Hinges

Scandinavian Pad Locks

Flat Key Brass and Iron Pad Locks, &c., &c.

625 Market St., Phila., Pa.

"FELTER'S PATENT LOCKS,"

MANUFACTURED BY

The American Lock Mfg. Co.,

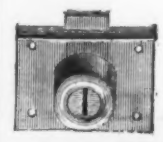
Are the most SECURE and DURABLE ever made.

SECURE

Because they have 40 Brass Tumblers, independent in their action, either one of which will prevent the Lock from being opened unless brought to proper position by the Key.

DURABLE

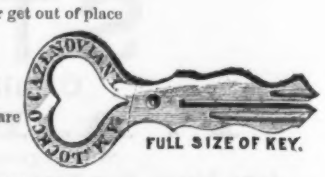
Because we use no Springs to break or get out of place

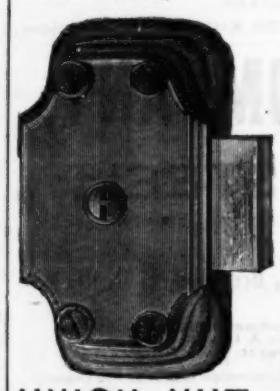


THEY HAVE

STERLING METAL KEYS

That will not corrode or wear, and are stronger than steel.





Upright Rim Dead Locks,

Horizontal Rim Night Latches,

Horizontal Rim Tubular Night Latches,

Mortise Night Latches, Plain Fronts,

Mortise Night Latches, Ornamental Bronze Fronts and Knobs,

Brass Chest, Box, Cupboard and Drawer Locks,

Solid Bronze Padlocks.

Illustrated Catalogue and Price List sent on application.

All orders should be addressed to

UNION NUT CO., General Agents, 99 Chambers St., N. Y.

THE IMPROVED HOWE SCALES

In Competition with the World, at Philadelphia, 1876

TWO FIRST MEDALS, and TWO DIPLOMAS OF MERIT

The following are the points that the Judges officially announce as the basis of their award of the highest honors to the Howe Scales:

1st. For their Protected Bearings (the Howe is the only Scale with protected bearings), which makes the Scale *DURABLY ACCURATE.*
2d. For their Strength.
3d. For their Simplicity.
4th. For their economy in construction.
5th. For their first-rate material and workmanship.
6th. For their various original improvements and adaptations (which being patented are exclusively possessed by the *HOWE*).

The Improved Howe Scales

MADE BY THE

BRANDON MFG. COMPANY, of Brandon, Vt.,

Are Guaranteed Superior to all others.

For Plans, Prices and other information, address,

A. M. GILBERT & CO., 95 to 101 Lake St., Chicago. 116 Main St., Cincinnati. 612 N. Third St., St. Louis.
PACE & CO., - 3 Park Place, New York City. 63 Wood St., Pittsburgh.
I. S. WILLIAMS, - - - - 213 Market St., Philadelphia.
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FROTHINGHAM & WORKMAN, - - - - Montreal, Canada.

V. G. HUNDLEY.

79 Reade Street, New York.

North Carolina Handle Co.,

Manufacturers of

SPOKES, AXE, PICK, SLEDGE, HAMMER, HATCHET and other HANDLES.

Full assortment always on hand.

PHILADELPHIA.

(Corrected weekly by Lloyd, Supplee & Walton).

Terms, 30 days. For 60 or 90 days, interest added at 10 per cent. per annum.

Anvils.
Peter Wright's, ⅌ ℔, gold....11 @ 10½c
Wilkinson's " ....11 c
Eagle....9 cents per lb—dis 20%

Apple Parers.—Domestic....per doz $ 6·50
Peach Parers.... " 10 50
Bay State Parer, Corer and Slicer.... " 12 50
Other makes.... " 7 50
Lots of 5 to 25 dozen special price.

Axes.—
Mann's (according to weight)..Per doz. $10 00 @ 9 00
Red Indian. " " " 10 50 @ 9 50
Red Chieftain " " " 11 00 @ 10 00
Hunt's " " " 12 50 @ 11 50

Augers and Auger Bits.—
Benjamin Pierce....dis 35 @ 40 %
Douglass' & Ives' Bits....dis 45 %
Connecticut Valley Auger Bits....dis 50 %
Cook's Bits....dis 50 @ 50&5 %
Jennings' Bits....dis 10 %
Bates' Nut Augers....dis 40 @ 40&10 %
Douglass' & Ives' Augers....dis 45 %
Watrous' Ship Augers....dis 20 %
Bonney's Pat. Hollow Augers....dis 25&10 %
Stearns' Patent Hollow Augers....dis 25&10 %

Balances.—
Light or "Common"....dis 25&10 %
All other Spring Balances....dis 25 %

Bells.—Bevin Bros. Mfg. Co. Light Hand Bells...dis 70 %
Hand. Common....70&10 @ 75 %
Swiss Pattern Hand Bells....dis 50 %
Connell's Door Bells....dis 50&10 %
Gt. Western & Kentucky Cow, new list....dis 40 %

Boring Machines.—Bates Mfg. Co., complete with augers....dis 25 @ 25&10 %
Douglas Mfg. Co., complete with augers....dis 40 %
Common Boring Machines, no Augers....$3 15 net
Angular " " ....4 00 net

Bolts.—Eastern Carriage Bolts....dis 75 @ 75&5 %
Western " " ....dis 75 %
Philadelphia " " ....dis 60&10 @ 60&20 %
Coleman " " ....dis 60&10 @ 60&20 %
Wrought Shutter, Stanley....dis 50 @ 50&10 %

Braces.—Barber's....dis 40&5 %
Backus....dis 50 @ 50&10 %
Bartholomew's American Ball....dis 20&10 %
Spofford....dis 50 %

Butts.—Cast Fast Joint. Narrow....dis 30, 12½&10 %
" " " Broad....dis 40, 12½&10 %
Cast Loose Joint....dis 50, 12½&10 %
" Acorn, Loose Pin....dis 45, 12½&10 %
" Acorn " Jap'd....dis 55, 12½&10 %
" Mayers and Parliament....dis 40, 12½&10 %
Lull & Porter's (Phila.) Hinges....dis 65 @ 65&10 %
Wrought Loose Pin....dis 40&5 %
" Table Hinges and Back Flaps....dis 35&5 %
" Narrow....dis 40&5 %
" Loose Joint....dis 40&5 %

Blind Butts.
Parker....dis 70 @ 70&10 %
Buffalo Hardware Co....dis 60 @ 60&10 %
Clark....dis 60 @ 60&10 %
Shepard....dis 60 @ 60&10 %
Garretson....dis 60 @ 60&10 %

Chains.—German Halter and Coil....dis 25 % gold
Galvanized Pump....net 10½c
Best Proof Coil Chain—

⅌ ℔....	12	9	8½	8	7¾	7¾	7c gold
	3-16	¼	5-16	⅜	7-16	½	⅝ in.

By the cask, 560 lbs., ½c per lb. less Common Chain, ½c per lb. less.

Chisels.—Socket Framing....dis 60, 10&10 %
Socket Firmer....dis 60 @ 60&10 %
Tang " ....dis 40 %
Beaty's Framing and Firmer....dis 20 %

Casters.—Iron Bed....dis 40&10 @ 50 %
Porcelain Wheel Bed....dis 40&10 @ 50 %
Iron and Brass Wheel Plate....dis 50 @ 50&10 %
Porcelain Wheel " ....dis 50 @ 50&10 %

Coffee Mills.—Common Box and Side....dis 25 %
Patent Box and Side....dis 25 %

Cutlery.—American Pocket (best)....dis 30 @ 33⅓ %
Landers, Frary & Clark, J. Russell & Co. and Lamson & Goodnow Mfg. Co. Manufacturers' net prices

Drawing Knives.—
Hart Mfg. Co.'s....dis 60&10 @ 60, 10&10 %
Adjustable Handle....dis 10 @ 15 %
Beatty....dis 15 @ 20 %

Fry Pans.
Tinned....dis 50 @ 50&10 %

⅌ doz..$3·50	4 00	4·50	5·00	5·50	6·50	7·50	9·00	10·00
No.... 0	1	2	3	4	5	6	7	8

Burnished....dis 50 @ 50&10 %

⅌ doz..$3·00	3·75	4·25	4·75	5·25	6·00	7·00	8·00	9·00
No.... 0	1	2	3	4	5	6	7	8

Files.
Nicholson Mill Files....new list, dis 25 @ 30 %
" Bastard.... " dis 25 @ 30 %
" Taper.... " dis 25 @ 30 %
Butcher's Mill....⅌ £ gold $4 75 @ $4 50
" Bastard....⅌ £ gold 4 75 @ 4 50
" Taper....⅌ £ gold 4 75 @ 4 50

Fluting Machines.
Mrs Knox—6 in. rolls....each, $3 00 dis 10 %
Imperial—4½ in. roll....each $2 75 net @ dis 10 %
" —6 in. roll.... " 3 00 net @ dis 10%
Crown—4½ in. roll....each 2 50 net
" —6 in. roll.... " 3 00 net
" —8 in. r ll.... " 4 25 net
Eagle—3½ in. roll....per doz. $18 00
" —5½ in. roll....per doz. 24 00

Hammers.
Yerkes & Plumb's....new list dis 25 %
Hammond & Son's....dis 25 %
Veree....dis 20 @ 25 %

Hatchets.
Beatty's....dis 25 %
Shingling and Half. { ⅌ doz...$7·00 7·50 7·75 8·00 / No.... 1 2 3 }
Yerkes & Plumb....dis 25 %
Shingling and Half. { ⅌ doz...$7·00 7·50 8·00 8·50 / No.... 1 2 3 4 }
Claw....{ ⅌ doz....$7·50 8·00 / No.... 1 2 3 }

Hinges.
Strap and T....dis 60&5 %

Horse Nails.

	Nos. 5	6	7	8	9	10
Putnam	32	28	26	25	24	23
Ausable Pointed & Polished, list	28	26	25	24	23	
Clinton Horse Nails	20	18	17	16	15	
" Polished and Pointed	21	19	18	17	16	
Globe	28	26	25	24	23	

Discount on Ausable, Globe and Putnam....dis 10 %

Knobs.—
Rim and Mortise....dis 35 @ 35&2 %

Locks and Latches.
Door Locks, Rim and Mortise....dis 35 @ 35&2 %
Till and Cupboard Locks....dis 25&5 @ 25, 5&2 %
American Padlocks....dis 33⅓ @ 33⅓&5 %
Scandinavian Pad Locks.
⅌ doz....$10·50 10·50 12·00 12·00 15·00 15·00 } 50&10 @
No.... 59 59½ 60 60½ 61 61½ } 50&15 %
⅌ doz....$18·00 18·00 22·00 22·00 } 50 %
No.... 62 62½ 63 63½
United States Lock Co....dis 35 %
Trunk Locks....dis 25 %

Lanterns.—Square Candle and Oil....dis 10 %
Globe for Oil....dis 10 %
" " Kerosene....dis 10 %
Tubular Lanterns....dis 10 %

Mattocks.—Long and Short Cutter....dis 25 %
Western Pattern....dis 25 %
Pennsylvania Pattern....dis 15 %

Molasses Gates.
Enterprise Mfg. Co.'s Measuring Faucets....dis 20 %
Stebbins' Gates....dis 62½&10 %
Lincoln's " ....dis 50&10 %
Landers, Frary & Clark's Petroleum....dis 15&10 %
Taylor's Petroleum Faucets....dis 20&10 %
Brass Liquor Cocks....dis 45 @ 50 %

Meat Cutters.—Dixon's....dis 25 %
Woodruff....dis 25 %
Stowe....dis 25 %
Hale's....dis 35 %
Stuffers....dis 25 %

Planes.—Auburn Tool Co. "Bench....dis 40 %
Second Quality....dis 50 %
Bailey Iron Planes....dis 25&10 %
Evans Pat. Circular....net

Plane Irons.—American....dis 10 %
Butcher's....gold £, $5 00

Plumbs and Levels.
Adjustable....dis 60&10 %
Non-Adjustable....dis 60&10 %

Picks.—Philadelphia....net
Pittsburgh....net

Rules—Boxwood....dis 55&10 %
Ivory....dis 45&10 %

Rakes.—Cast Steel Garden....dis 40 @ 40&10 %
Malleable Garden....dis 40 @ 40&10 %
Wood Head Iron Teeth....dis 40 @ 40&10 %

Steelyards.—American Pattern....dis 20 @ 25 %
⅌ doz....$5·50 7·00 9·00 10·00 1[illegible] 12·00
No.... 50 100 150 200 25[illegible] 300
English Pattern....dis 15 @ 20 %
⅌ doz....$7·00 8·67 10·67 12·67 14·67 16·67
No.... 50 100 150 200 250 300
Hart's Pattern....dis 55 @ 55&10 %
⅌ doz....$14·50 17·75 21·00 26·50 31·00 35·50
No.... 50 100 150 200 250 300

Scythes.—Golden Clipper, Damascus Blade, Boxed and Sharpened....⅌ doz. $9·50
Clipper No. 10, Bronzed Blade Boxed and Sharpened....⅌ doz. $9·00
Clipper No. 5, Painted Red, Boxed and Sharpened....⅌ doz $8·50
Cast Steel Scythes....$7·50 @ 8·00
German " ....6·50 @ 7·00

Squares.—Steel and Iron, new list....dis 30 %

Saws.—Disston's Cross Cut, No. 1....per ft., 55c
Disston's Cross Cut No. 5....per ft., 50c
Disston's Cross Cut, Patent....per ft., 50c
Disston's Circular Saws....dis 25 @ 30 %
Disston's Hand Panel and Rip, &c....dis 20 %
W. McNiece's H'd, Cross-Cut & Circ'r, new list..dis 15 %
Boynton's Lightning Cross-Cut....dis 50 @ 50&10 %
Boynton One-Man Cross Cut Saws....dis 40&10 %

Shovels and Spades.
Rowland's Plain Back....dis 47½&2½ %
" Back Strap....dis 47½&2½ %
Extra discount on above for 10 days' cash, 5 %.
Oliver Ames & Sons, new list....dis 30 %

Sad Irons.—Richmond (polished face)....per lb. 3½c
Richmond (polished face).... by the cask " 3

Stone.—Arkansas Oil, No. 1....⅌ ℔ $
Turkey Oil, No. 1.... " 25c
Washita Extra....net " 35c
" No. 1....net " 30c
" " 2....net " 25c
Hindostan 8 inch....⅌ ℔ 4¼ @ 4½c., net

Screws.
United States and others in Combination....dis 60 %

Spoons.—
Plated....dis 40 @ 40&5 %
Britannia, Boardmans (new list)....dis 50&10 %
" Parkers (old list)....dis 50 @ 50&10 %
German Silver....dis 25&5 %
Lalance & Grosjean Iron....dis 10&5 %
" " " by case....dis 20&5 %

Springs.—Gray's Door....$2 15 @ $2 25
Torry's Door....2 15 @ 2 25
Gem....dis 10 %

Stocks and Dies.....dis 10&5 %

Stove Polish.—Gem....⅌ gross, $4·25 @ 4·50
Onyx.... " $4·00 @ 4·25
Dixon.... " $5·75 @ 6·00

Try Squares.—Winterbottom....dis 20 @ 20&10 %
Stanley Rule and Level Co....dis 45&10 %
Willis Thrall, No. 2....dis 30&10 %
Disston's No. 2....dis 45 %

Tacks, &c.—Half Weight Tacks....dis 75 @ 75&10 %
Trunk, Clout and Finishing Nails....net to 10 %

Traps.
Genuine Oneida—Newhouse....list dis 25 @ 25&2 %
Im. Oneida—Newhouse list (1st qual.)....dis 40&45 %

Vises.—Solid Box, Trenton....⅌ ℔ 12½c

Wrenches.—Coes Genuine....dis 50 %
Coes Pattern Wrought Bar....dis 50&10 %
" " Malleable Bar....dis 70&10 @ 75 %
Girard Wrenches, Coe's Pattern....dis 50&10 %
" Agricultural Wrench.... } $3·60 $5·40 net
Wrought Bar, Coe's Pattern.... } 10 12 in
Tafts Pattern (Wrought Bar)....dis 70 @ 70&10 %
Philadelphia Tool Co.'s Pat. Duplex....dis 25 %
" " " Improved Baxter....dis 25 %

Wire.—
No. 0 to 18....dis 52½ @ 55 %
No. 19 to 26....dis 57½ @ 60 %
No. 27 to 36....dis 60 @ 62½ %
Coppered 0 to 18....dis 47½ @ 50 %
Tinned Broom Wire....dis 35 %
Galvanized Wire No. 1 to 18....dis 25 %

Wringers.—Novelty No. 10....$63 00
Novelty No. 2....66·00
Universal....66·00

BUFFALO.

Reported by Messrs. Sidney Shepard & Co.
May 28, 1877.

Apple Parers—Bay State....per doz $12·00
Faultless Turn Table.... " 7·50
Lightning.... " 7·50
Peach Parers.... " 12·00
Potatoe Parers.... " 12·00
Climax Corer and Slicer.... " 6·00
Bells, Cow—Yaw's Genuine....dis 50 %
Braces—Bit, Spofford's Patent....dis 50 %
Brads, Cut....dis 50&10 %
Brass—Sheets....list net
Boards—Stove, Brooks' Pat. dis 35 % 4 mos.; 35&5 % 30 dys
Bolts—Stove....dis 45 %
Brick—Bath (box of 2 doz) Best English....$1·13
Can Openers—Sprague's....dis 55&10 %
Cases—Parlor Coal Hod....dis 15 %
Chisels—Firmer Socket....dis 60, 10&10 %
Framing Socket....dis 60, 10&10 %
Corner Socket Chisels....dis 60, 10&10 %
Slick's Carpenters'....dis 60, 10&10 %
Castings—Malleable....⅌ ℔ 7½c
Cocks—Globe and Bibb....dis 45 %
Cutters—Meat, "Hales"....40 %
Egg Beaters—"Dover"....per doz $4·00
"Family"....per doz $3·00
Elbows—Corrugated....dis 20 %
Adjustable....dis 20 %
Columbus....dis 25 %
Files—Matschoss Bros....dis 50&10 %
Fluters—Geneva Hand....⅌ doz. $15·00
Freezers, Ice Cream—"Champion"....dis 33⅓&5 %
Hinges, Gate—Shepard's....dis 40 %
Hinges—Window Blind—
Shepard's and Standard....dis 60 %
Hods, Coal—Plain, Black and Galvan'd...new list dis 15 %
Funnel, Black and Galvanized.... " dis 15 %
Fancy and Helmet.... " dis 15 %
Sad Irons....5c
Kettles—Brass....⅌ ℔ .45c
Copper, "Hand Made"....38c.
Enameled....dis 60 %
Knives, Drawing—Oval No. 1....dis 60, 10&10 %
Razor Blade....dis 60&10 %
Lanterns, Tubular—with guard....$11·50 } dis 15 %
Without guard....11·00 }
Mills, Coffee—Box and Side, common....dis 25 %
Box Union and Eagle....dis 20 %
Cut Nails, "Chesapeake," 10d....$2·70
Horse, Ausable....No. 5 7 8 9 10
30 27 25 24 23 22c
" " Pointed & Polished....add 1c ⅌ ℔
" " 1000 lbs....dis 5 %
Paint—White Lead, U. S. Gov't....⅌ ℔ 8½c
Pans—Dripping....⅌ ℔ 9c
Frying....dis 50 %
Rivets—Iron, Black and Tinned....dis 40 %
Screws—"American Screw Co"—
Flat Head, Iron....dis 60 %
Flat Head, Brass....dis 55 %
Sieves—Wood, Hoop Iron....$1·20
Tinned....1 50
Sifters—Ash....$9·00 @ $12·00
Skates and Straps—White's....dis 30 %
Spoons, Iron Tinned....dis 10 %
" by the case....dis 20 %
S. S. & Co., Kitchen....dis 20 %
Plated Rogers' A No. 1....dis 40&5 %
Britannia....dis 55 %
G. S. Hall, Elton & Co....dis 25 %
Scales—Buffalo Scale Works....dis 25 %
Fairbanks....dis 15 %
Stove Polish—Gem....⅌ gross, $4·50
" Dixon's....6·00
Palace....⅌ gross, $3·00; bulk, per ℔.. 9c
Rising Sun....⅌ gross, $5·75
Squeezers—Lemon, Porcelain....⅌ doz., $5·40
Tacks—Half Weight Am. Iron....dis 75&10 %
Tea Trays....dis. 15 %
Thermometers—Tin Case....dis 50, 10&10 %
Tools—Tiemens'....dis 10 %
Vases—Palace Coal....dis 15 %
Vises—
Parallel, Buffalo....dis 30 %
Wire—Brass and Copper....list net
Wire—Bessemer Steel....dis 20 %
Wringers—Novelty....$66·00

Tin Plates.—Add for each X....2·50
10x14, IC, Charcoal... $7·15 | 14x20 C, terne....$6·70
12x12, " ... 7·15 | 20x28 C. " 13 90
12½x17, " ... 6·65 | 20x28 X. " ....13·90
14x20, " ... 7·15 |

Pig Tin—Straits....21c @ 22c
Bar Tin....23c

Solder—S. S. & Co. No. 1....13c
S. S. & Co. Extra....16c

Sheet Zinc—
"Lasalle"....570 100 ℔ casks
$7·50 7·80 ⅌ 100 ℔s
Sheets....$7·50

Babbitt Metal....⅌ ℔ 12c

Iron Wire—Bright and Annealed....dis 52½ %
Coppered....dis 47½ %
Tinned....dis 35 %
Tinned Broom, { Nos. 20 21 22 / 20c 21c 21c } ....dis 40 %

Copper—Sheathing 14 @ 18 oz....⅌ ℔ 31c
Planished....⅌ ℔ 37c
" Boiler Sizes....⅌ ℔ 39c
Bottoms....⅌ ℔ 33c
Bolts....⅌ ℔ 32 @ 34c
Braziers' Sheets....⅌ ℔ 32 @ 34c

Sheet Iron.
18 Common....$3 10
24 Common....3 30
26 Common....3 50
24 W. D. Wood & Co., Smooth Finish....4 25
Planished....A. B.
11c 9½c
Gen. Russia, No. 1 stained....12½c
" " clean....13c
Galvanized....dis 40 %

Tin Ware.
Deep Stamped Plain and Retinned....33⅓ %
Com. " " ....dis 20 %
Japanned " " ....dis 20 %

CHICAGO.

(The Chicago Stamping Co., 72, 74 & 76 Lake St.)
March 1, 1877.

Tin Plate.—
10x14, IC, Ch'l. Good.$ | 14x20, IXX, Ch' Best. 12 75
10x14, IC, " Best, 7 75 | 14x20, IXXX, " " 15 25
10x14 IX, " " 10 25 | DC, 100 Plate " " 7 75
12x12, IC, " " 7 75 | DX, " " 10 25
14x12, IX, " " 10 25 | DXX, " " 12 75
14x20, IC, " " 7 75 | DXXX, " " 15 25
14x20, IX, " " 10 25 | IC, Roofing, " " 7 25
| IX, " " " 9 75
20x28, IC, Charcoal Roofing, Good....14 50
20x28, IC, " Best....15 00
20x28, IX, " " 19 50
10x14, IC, Coke Plates....7 00
14x20, IC, " 7 25
10x20, IC, " 11 25

Block Tin.—
Large Pigs....24c | Bars....26c
Small....25c |

Zinc.—Sheet, 500 to 1000 ℔. Casks....8 c
Loose Sheets....8½c
Slab Zinc or Spelter....7 c

Copper.—Bottoms....34c
Sheathing....32c
Planished....38c
" Boiler lengths....40c
Bolt....35c

Braziers' Sheets.—
30x60, 6 to 7 lbs....⅌ ℔ 38c | 30x60, 10 to 12 lbs...⅌ ℔ 34c
30x60, 8 to 9 lbs.... " 36c | 30x60, 15 to 100 lbs. " 33c

Solder.—F. S. & Co.'s make
Best Fine....18c
No. 1....17c
Roofing....15c
Braziers or Spelter Solder....35c

Antimony....20c

Babbit Metal—F. S. & Co.'s....16c
No. 2....14c

Sheet Iron.—

	Common.	Smooth. Com.	Smooth Charcoal.	Smooth Juniata
No. 24	3½c	4½c	6¼c	8½c
25 & 26	3¾c	4¾c	6½c	8½c
27	4 c	5 c	6¾c	8¾c

Galvanized Iron.—
No. 16 to 20....12c | No. 27....15c
21 to 24....13c | 28....16c
25 & 26....14c |

Russia Iron.—
Perfect....14c | No. 1 Stained....13c
| In Sheets, 1c. higher.

American Russia.—
A....12c | B....10c
| In sheets, 1c higher.

Lead.—
Pig....7½c | Lead Pipe, in full coils 9
Bar....8½ | Lead Pipe, when cut.. 9½
| Sheet Lead.... 9½

Wire—Bright....dis 4[illegible] %
Coppered....dis 40 %

PITTSBURGH.

The following are the Card rates, f. o. b. in Pittsburgh of Lewis, Oliver & Phillips, H. B. Newhall, 11 Warren St. New York, Agent.

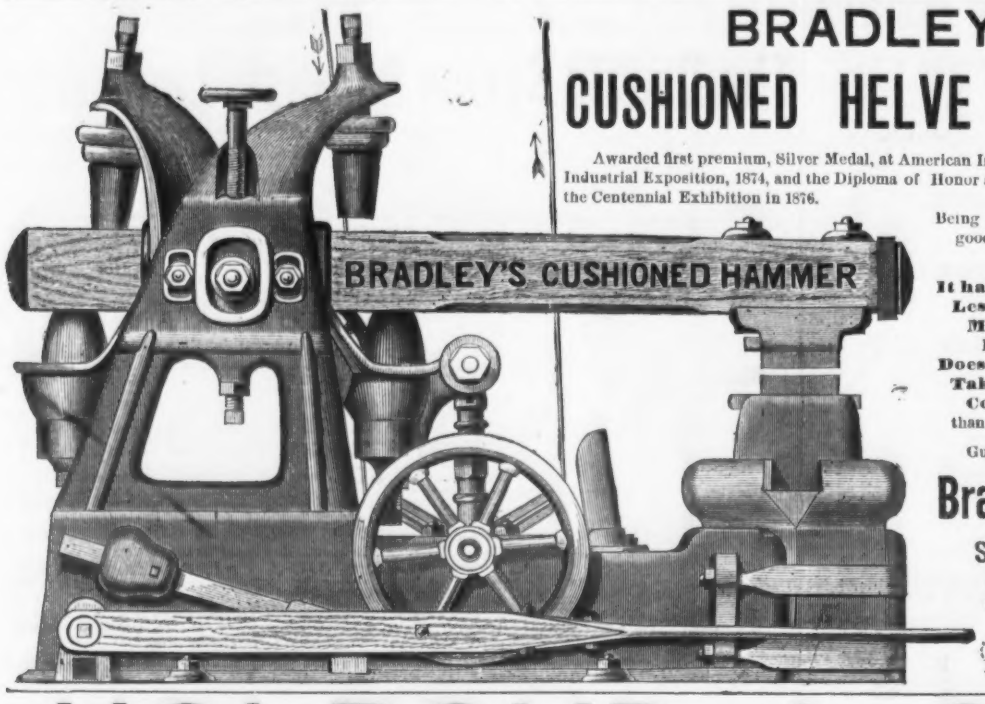
Merchant Bar Iron....[illegible]c rates net
Flat Rail (1½x¼), punched and coun'sunk..3¾c ⅌ ℔ net
Iron Wedges....3¾c ⅌ ℔ net
Norway Nail Rods, Vasa....7 c ⅌ ℔ net
Iron Crow Bars (in ordering please state whether "Wedge" or "Pinch" point)...4 c ⅌ ℔ net
Beetle Rings....5¾c ⅌ ℔ net
Fence Pickets—
⅝ r'nd, bent to shape, 25c ⅌ ft. of fence, less 15 % off net
Discount off Standard List.
Carriage and Tire Bolts, $500 worth purchased in six months, ending July and Jan. 1....75, 5&3 % off net
Stove Bolts....40 % off net
Elevator Bolts....30 % off net
Machine and Square Head Bolts....60 % off net
Coach and Lag Screws....60 % off net
Bolt Ends....60 % off net
Pat. Hot Pressed Sq. and Hex. Nuts....7½c ⅌ ℔ off net
Washers, all made from new band iron..7½c ⅌ ℔ off net
Nuts and Washers in 25 lb. boxes, ½c ⅌ ℔ ex. Nuts and Washers in lots less than one keg each size, ½c ⅌ ℔ ex. Nuts and Washers in 5 lb. boxes, 1c. ⅌ ℔ ex.
Standard Caps, for Plows....4½c. ⅌ ℔ net
Iron Harrow Teeth, in lots of 1 ton or more, packed in 200 lb. boxes, 1 in. diam. 2¾c ⅌ ℔ net; ⅞, ¾ in. diam. 2¾c ⅌ ℔ net; ⅝ in. diam. 3c ⅌ ℔ net.
Pat. Headed Harrow Teeth, packed in boxes, ½c ⅌ ℔ ex.
Skein Bolts, in bulk, in lots of 1 keg or more, ⅝ in. diam. 4½c ⅌ ℔ net; 9-16 in. diam. 5½c ⅌ ℔ net; ½ in. diam. 6½c ⅌ ℔ net. ½c ⅌ ℔ extra when less than 1 keg of each size is ordered.
Screw Hook and-Eye Hinges, with Pat. Hooks, ¾ to 1 in. diam., 7c ⅌ ℔ net; ⅝ in. diam., 8c ⅌ ℔ net; ½ in. diam., 10c ⅌ ℔ net.
Screw and Strap Hinges—all sizes under 28 in. long have Pat. Hooks, 14 to 36 in. long, 3 4-10c ⅌ ℔ net; 6, 8, 10 and 12 in. long, 4 9-10c ⅌ ℔ net.
Strap & T Hinges....60&10 % off net
Hereafter we will not make any allowances for freight on Strap and T Hinges; our price on them is F. O. B. in Pittsburgh.
Screw Hitching Rings, light, with ¼ ring, No. 1, $4·00 ⅌ 100 net; heavy, with 5-16 ring, No. 2, $4·50 ⅌ 100 net.
Bridge and Roof Bolts—
1 to 2 in. diam. over 8 ft. long....⅌ ℔ 3¼c net
1 to 2 in. diam. from 4 to 8 ft. long.... " 3½c net
1 to 2 in. diam. from 1½ to 4 ft. long.... " 3¾c net
⅝, ¾ and ⅞ in. diam. over 4 ft. long.... " 4 c net
⅝, ¾ and ⅞ in. diam. from 1½ to 4 ft. long " 4½c net
Bridge bolts with upset ends....¾c. ⅌ ℔ extra
Wrought iron plates, punched....4½c. ⅌ ℔ net
Cast Iron Washers....⅌ ℔ 3½c net
Grass Rods....7½c ⅌ ℔ net
Heel Bolts....8½c ⅌ ℔ net
Duck Nest Tuyere Irons....$13·50 ⅌ doz net
Wrought Iron Repair Links....15 % off net
" Rings....50 % off net
" Lap Rings....33⅓ % off net

WAGON HARDWARE.

Single Trees, Neck Yokes and Double Trees, made from best selected Hickory, and ironed complete, in the most approved patterns.
No. 1 Southern Plow Single Tree, Ironed complete, Irons all Wrought....each, 38c net
No. 2 Western Plow Single Tree, Ironed complete, Irons all Wrought....each, 50c net
No. 3 Wagon Single Tree, Ironed complete, Irons all Wrought, except Malleable Ferrule....each, 60c net
No. 4 Wagon Single Tree, Ironed complete, Irons all Wrought; Improved End Pieces riveted on; one side acts as a wear iron for wheel to rub against....each, 60c net
Neck Yoke, Ironed complete, Irons all Wt., except End Ferrules, with Wt. Iron Rings.each, 70c net
Southern Plow Double Tree, ironed complete, irons all wrought....each, 60c net
Wagon Box Strap Bolts—For Orders of 50 Set, 45 % dis.

10 in. long by	7-16 at Screw End, ⅌ set of	8	bolts..	45c
12 "	½ " "	8	" ..	55c
10 "	9-16 " "	8	" ..	65c
12 "	9-16 " "	8	" ..	70c
14 "	9-16 " "	8	" ..	80c
10 "	⅝ " "	8	" ..	80c
12 "	⅝ " "	8	" ..	80c
14 "	⅝ " "	8	" ..	90c
16 "	⅝ " "	8	" ..	1·00
18 "	⅝ " "	8	" ..	1·10
20 "	⅝ " "	8	" ..	1·20

5c ⅌ set for each additional inch over 14 in. All lengths made.
In ordering Box Strap Bolts please give diameter at Screw End.
Wrought Iron Bolster Plates, 2¾ in. wide, ⅌ set....45c
" " " 3 " " 50c
" " " 3¼ " " 55c
" " " 3½ " " 60c
Wrought Hammer Straps, heavy pattern, each....13 c
" " " light " each....12 c
" Rub Irons, each....9 c
Double and Single Tree Clips, figure 1, each....8 c
" " " " 2, each....9 c
" " " " 3, each....11 c
Pole Caps, each....20c
Strap Bolts, Bolster Plates, Hammer Straps, Rub Irons Clips and Pole Caps, in lots of 50 sets....dis 45 %
For each order amounting to $200 net, or over, for the following goods: Wagon Hardware, Carriage and Tire Bolts, Rivets, Skein Bolts, Nuts, Washers, Chains, Bevel Box and Tongue Cap Iron, we will allow an extra discount of 10 per cent. off all Wagon Hardware, subject to discount, comprised in the order. Jobbers who do not deal in iron, we allow to substitute Strap and T Hinges in lieu of Bevel Box and Tongue Cap Iron to make order up to $200 worth and secure the extra discount of 10 per cent.
Single Tree Hooks, Nos. 1 and 2....each, 3½c net
Single Tree Irons, New Pattern....each, 4½c net
Stay Chain Hooks....each, 3½c net
Wagon Box Rods, narrow track, with Pat. Collar....each, 7½c net
Wagon Box Rods, wide track, with Patent Collar....each, 8½c net
Wagon Brake Ratchets....each, 7 c net
" " " finished with guard..each, 20c net
Single Tree Iron, Wt. Hook, Malleable Ferrule....each, 7½ net
Single Tree Iron, Wt. ⅜ Hook and 7-16 Clip..each, 7c net
Single and Double Tree Iron, Wrought Center Clip, ⅜ in. Welded, with ½ in. Ring...each. 10c net
Southern Plow Center Clip, ½ in. Welded, and 7-16 End Clip with 5-16 in. Hook—per set of 3 pieces. 20c net
Neck Yoke End Ferrule, Malleable, with Wt. Iron Ring....each, 6½c net
Neck Yoke Attachment, with plates complete....each, 23c net
Axle Tree Clips, No. 1....each 2¾c net
" " No. 2.... " 3¾c net
" " For Farm and Lumber Wagons, Shank, 9-16 in., flat part 1¼ in....each, 6¾c net
Plow and Wagon Clevises....⅌ ℔ 7c net
California Tire Rivets and Burrs, 5-16.... " 10c net
" " " " ¼.... " 11c net
Wagon Box Staples, 1¼ to 2½ in. to clinch. ⅌ 1000 $10·75 net
" " " Bevel Box Iron, to rivet on, ⅌ 1000 7·25 net
Neck Yoke Eyes, each....4½c net
" " with ⅜ rings, each....7c net
King Bolts, ¾, 1, 1⅛, and 1¼ in. diam....⅌ ℔ 3½c net
Wagon Rivets, ex. large flat, oval and steeple head, ¼ in. diam., 1 in. and longer.... " 7 c net
Wagon Rivets, 3-16 in. diam., 1 in. and longer " 8 c net
" ¾ to 1 inch long....⅌ ℔ 1c extra
" & Nails, in 5 ℔ paper boxes.... " 1c extra
" " in 25 ℔ wood " .... " ½c extra
Wagon and Hinge Nails, pointed by hand—
¼x3 and longer. 2½ & 2¾ 2 & 2¼ 1¾ and shorter.
11c ⅌ ℔. 13c ⅌ ℔. 15c ⅌ ℔. 17c ⅌ ℔ net
3-16x3 and longer. 2½ & 2¾ 2 & 2¼ 1¾ and shorter.
12c ⅌ ℔. 14c ⅌ ℔. 16c ⅌ ℔. 18c ⅌ ℔ net
Wagon Rivets and Nails, in less lots than one keg each size....⅌ ℔ ½c extra
Double Tree Plates.... " 7½c net
Coupling " .... " 4½c net
Tongue " .... " 7¾c net
Neck Yoke Plates.... " 8¾c net
Tongue Cap Iron, 1¾, 2 & 2¼ in. wide, same price ⅌ ℔ as No. 12 Band Iron.
Sand Band Iron, 1½ in. wide, same price as No. 12 Band Iron.
Hub Band Iron, ½c ⅌ ℔ over price of same size Band Iron.
Wagon Chains, Stay, Lock and Tongue, 5-16 in. ⅌ ℔ 7c net; ¼ in., 8c net.
Our prices are all subject to change of market, without notice.



BRADLEY'S CUSHIONED HELVE HAMMER.

Awarded first premium, Silver Medal, at American Institute Fair, 1873, Cincinnati Industrial Exposition, 1874, and the Diploma of Honor and Grand Medal of Merit at the Centennial Exhibition in 1876.

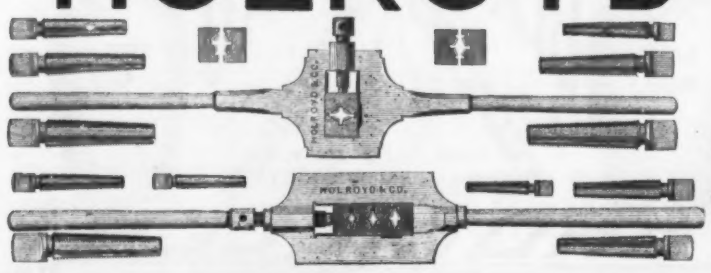
Being the highest award given any goods of their class in America or Europe.

It has More Good Points,
Less Complication,
More Adaptability,
Larger Capacity,
Does More & Better Work,
Takes Less Power,
Costs Less for Repairs,
than any Hammer in the World.

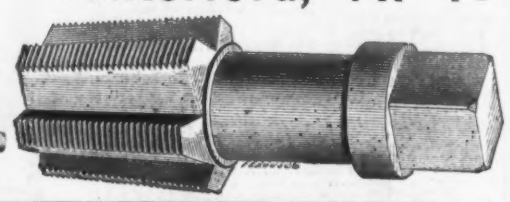
Guaranteed as Represented.

Bradley Mfg. Co
SYRACUSE, N. Y.
(Established 1832.)
Western Office, *22 S. Canal St., Chicago, Ill.*
A. B. BARNES, Manager.

HOLROYD & CO.,

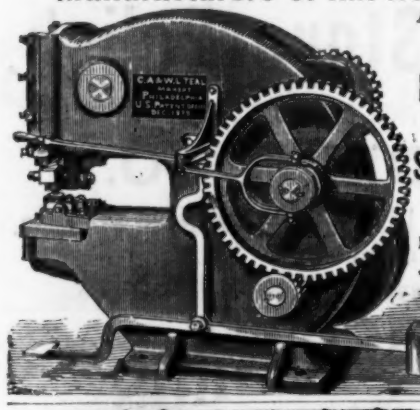


Waterford, N. Y.



C. A. & W. L. TEAL,

Manufacturers of IMPROVED BENDING ROLLS

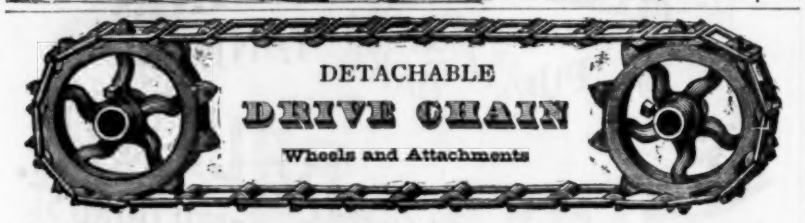


Arranged for Removing Work from the end of top roll.

COMBINED
Punching & Shearing Machines,
With "Automatic Stop motion,"
Adjustable to any point of the stroke.
Single Power Punching Machines,
With Shearing Attachments.
Steam Riveting Machines,
Boiler Makers' and Machinists' Post Drilling Machines, Hair Picking & Cleaning Machines, and
MACHINERY
in general.
4116 Ludlow St., Philadelphia.

ISRAEL H. JOHNSON, JR. & CO.,

TOOL & MACHINE WORKS,
Manufacturers of Engine, Brass Finishers', Wood Turners', Amateurs' and Jewelers' LATHES.
Slide Rest, Screw Machines, Turret Heads, Screw Presses, Screw Clamps, Lathe Carriers, &c.
440 N. 12th St., above Noble, Philadelphia, Pa.
Israel H. Johnson, Jr., Joshua E. Johnson, Jr.



Positive transmission. Stands **Exposure.** **Noiseless** in service.

NO Friction. Tension. Stretching.

Runs **Fast** or **Slow,** on all size wheels. Runs **Perpendicularly.**

For carrying **Buckets** and **Attachments** it has no equal.

Is a **Profitable Substitute** for Belting, Shafting, Gears and Ropes.

Adapted to all kinds of **Machinery.** Finds various uses in **Mills, Mines, &c.**

☞Plans for any purpose furnished on application.☜

Send for new Catalogue and Price List for 1877.

EWART MANUFACTURING CO.,
89 Madison Street, CHICAGO.
J. C. COONLEY, Prest. & Treas. W. D. EWART, Gen'l Sup't. J. F. POTTER, Sec'y

LANE & BODLEY CO.,

HYDRAULIC ELEVATORS

For Stores, Warehouses, Residences and Hotels.

These elevators have advantages over special steam service, in first cost of construction, running expense, convenience, cleanliness and saving of insurance.

We have a large number in operation and they have been fully tested. Satisfactory results guaranteed.

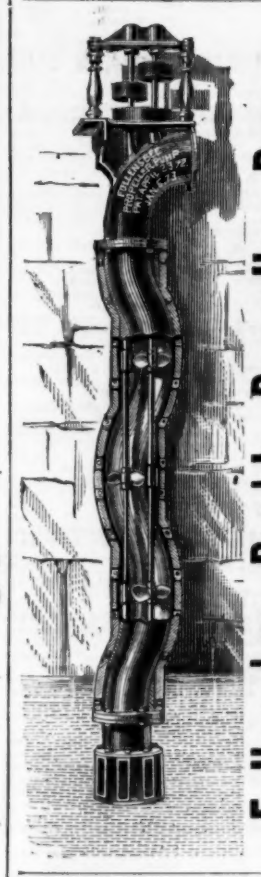
LANE & BODLEY CO.,
John and Water Streets, Cincinnati, O.

THE
Green River TIRE UPSETTER.

PRICE, $20·00.

Will upset, stretch and weld equally well on the lightest Steel Tire and on Wagon Tire 3 inches thick.

Frasse & Co.,
AGENTS,
62 Chatham St., New York.
Importers of and Dealers in
Fine Tools,
Files, Steel Wire, &c.



Follansbee Double Propeller Pump.

Medal and Diploma Awarded, Centennial Exposition, Philadelphia, 1876.
KILVERT & TAPPAN, General Agents,
Room 38, Simmons Building, Cor. Water and Congress Sts. Boston, Mass.

FIRE HYDRANTS

AND
Eddy Valves.
All Styles and Sizes.

Made (and patents owned) by
THE
MOHAWK & HUDSON MFG CO.,
WATERFORD, N. Y.

Guy C. Hotchkiss, Field & Co.

85 First St., Brooklyn, E. D., and New York City,
WILL SELL

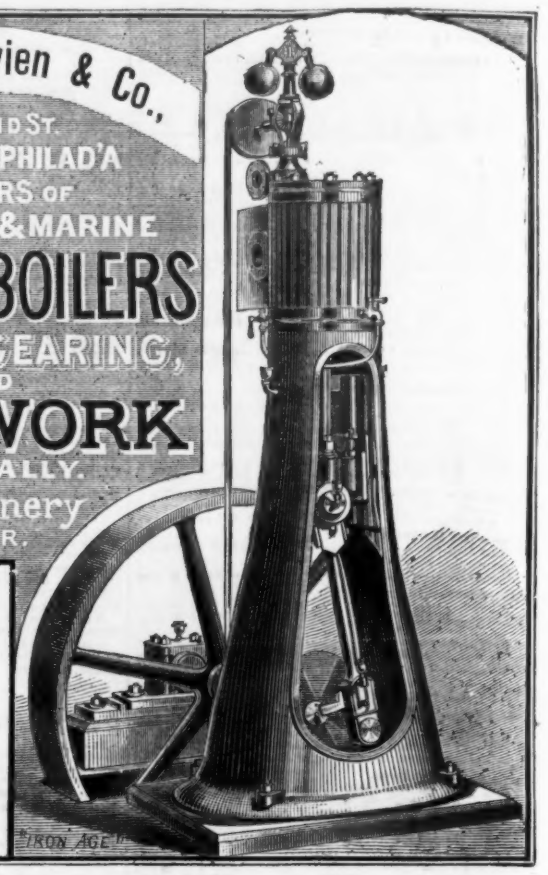
SPRINGS

Lower than anyone else.

Send for prices and give estimate of quantity you will be likely to buy during six months or a year, upon which we will base quotation.

MANUFACTURE
CARRIAGE MATERIALS, AXLES, SPRINGS,
Blacksmiths' Supplies,
BOLTS, WOOD WORK, TRIMMINGS, &c.

Chas. W. Ervien & Co.,
IRELAND ST.
Kensington, PHILAD'A
BUILDERS OF
STATIONARY & MARINE
ENGINES, BOILERS
SHAFTING, GEARING,
AND
MILL WORK
GENERALLY.
Special Machinery
BUILT TO ORDER.



Vertical
AND
Horizontal
Engines,
Of New and Heavy Designs, from 2 to 100 H. P., on hand or in process of erection.

THE
"INDEX" TIRE SHRINKER!

No. 3 Weighs 180 Pounds.—Price, $25.

☞ The most powerful and convenient Tire Shrinker ever offered to the trade.

The Anvil affords the means of **welding the Tire or Bar while in the machine;** an advantage possessed by no other Shrinker made.

☞ One man (or boy) can work it alone! And it can be used equally well right or left handed.

The shrinkage is made in the most perfect manner, leaving the **iron unmarked,** the **exact amount of shrinkage** being shown by the **index**

Adapted to light or heavy tire, and of any diameter.

☞ These perfect Tools, in general use throughout the West, are made only by the

Murray Iron Works Company,
BURLINGTON, IOWA.

TO MANUFACTURERS & DEALERS IN SKATES.

CAUTION.

A re-issue of letters patent Aug. 18, 1874, No. 154,176, re-issued May 4, 1875, No. 6,410, re-issued Feb. 20, 1877, No. 7,524, application filed Nov. 14, 1876, having been granted to Oliver Edwards, all manufacturers and dealers are notified that they must cease making or selling any skates infringing the same. Special attention is invited to claim 8, "a skate runner having its bottom constructed with a laterally projecting rib and its standards provided with plate supporting brackets, all made in a single piece of metal, substantially as and for the purpose described."

Nearly every cheap, all-metal skate in the market infringes this claim. Manufactured only by the

FLORENCE MACHINE CO., Florence, Mass.

BOSTON.

Reported by Macomber, Bigelow & Dowse, 156 to 164 Oliver St.

Anvils.—"Eagle American".....per lb. 9c; dis 20 %
Augers.—Watrous Ship.....dis 10 %
L'Hommedieu Ship.....dis 30 %
Axes.—Blue Jacket..... 9 00
Racer..... 8 00
Red Cross, Handled..... 10 50
" " Boy's..... 9 00
Blue Jacket " " 10 00
Axe Handles.—Wadleigh's Oak—
A (Extra) $2 50. B (No. 1) $2 00. C (No. 2) $1 50 ₩ doz
Blind Hinges.—Orr or Washburn's..₩ hun'd sets $8
Blind Fasts.—
Orr or Washburn's.....per hundred set $6 00
Bolts.—Carriage, Phila.....dis 60&20 %
Carriage, Common.....dis 75&10 %
Borax.—Best Refined.....₩ lb 11c
Borers.—Angle, Backus'.....dis 30 %
Boring Machines.—Angle.....each $4 50
Common. Snell's quality.....each 3 50
Braces.—Barber's.....dis 40&5 %
Backus'.....new list 50&10
Spofford's.....dis 50 %
Bracket
Saw Frames, with patterns complete.....₩ doz $6 00
Saws..... " 88
Saw Frames, Centennial..... " 3 50
Star Bronzed.....new list net
Star Japanned.....new list net
Store Shelf.....new list net
Brass Faucets.—L. F. & C.....dis 40 %
Brushes.—Horse, Patent Metallic.....per doz. $4 50
Butts.—Union Drilled Loose Joint.....dis 45, 12½&10 %
" " Wire Fast Joint, dis 25, 12½&10%
" " Acorn Loose J't, dis 45, 12½&10 %
Brass Butts.....dis 30 %
Wrought Table Butts and Back Flaps.....dis 30 %
.....revised list, dis 35 %
Wrought Narrow Butts.....reduced, dis 40 %
Cards.—
Curry Cards, No. X, per doz., $0 75.....dis 30 %
Horse " No. X, " 0 80.....dis 30 %
Wool " No. 8X, " 2 50.....dis 15 %
Cotton " No. 10, " 3 00.....dis 10 %
Cartridges.—U. S. Cartridge Co.....dis 60 %
Chisels.—"Buck Bros." Shank Goods.....dis 30 %
Socket.....dis 25 %
Compasses and Dividers.—Bemis'.....dis 40 %
P. S. & W.....dis 30 %
Cordage.—Manila (usual trade dis.).....₩ lb. 14c
Corn Hooks.....per doz $2 75
Crow Bars.—Solid Steel.....₩ lb. 9c
Cow Ties.....dis 30 %
Dividers.—Cook's Nickel Plated.....dis 15 %
Door Springs.—Mossey—

Per doz.	$9 00	12 00	15 00	18 00	24 00
No.	0	1	2	3	4

Torrey's.....$2 50
Gem.....dis 10 %
Drills.—Whitney's with Chucks.....$12 50
Emery.—Alden.....₩ lb 7c
Wellington Mills.....₩ lb 10c
Files.—American.....dis 30 %
Nicholson, new list.....dis 30 %
Wheeler, Madden & Clemson.....$5 to $; 7½ to $; 10 to $; $11 88; 4½, $2 13; 5, $2 50
Hammers.—Maydole—new reduced list.....dis 15 %
M., B. & D., solid cast steel, adze eye, No. 1, $10; 1½, $9 75.....dis 25 %
M., B. & D., solid cast steel, bell face, No. 1 $11; 1½, $9 75.
Hammond—new reduced list.....dis 15 %
Hangers & Rollers.—Anti-Friction.....dis 40 %
Climax.....dis 40 %
Acme Rollers.....dis 40 %
Hatchets.—Underhill Edge Tool Co.....dis 25 %
C. F. Dowse, warranted Cast Steel—
Shingling.....0, $4 75; 1, $5 25; 2, $5 75
Claw.....1, 5 75; 2, 6 25
Lathing.....1, $5 50
Axe Pattern.....1, $7 00; 2, 7 50
Broad.....0, $5 75; 1, $6 50; 2, $7 50; 3, $9 25; 4, $10 75
5, $12 75; 6 $14 75
Hinges.—Strap and T Stanley Works.....60&5
Plate, Loose and Fast Joint.....₩ lb 5c
Wrought Screw Hook.....₩ lb 5c
Knobs.—Imp. Extension Silvered Glass....₩ doz $8 00
Lanterns.—Tubular No. 0.....$ 9 50
Guarded. No. 74, (with kerosene oil and candle burners).....5 50
Lead.—Sheet, 9½c.; Pipe, 9c.....dis 10 %
Locks.—Norwalk Lock Co.....dis 35 %
Mattocks.—
K. P. & Co., axe finish, long cutter.....$11 50—net
Short cutter.....11 00—net
Meat Cutters.—"Miles's" Challenge.....dis 30 %
No. 1, $22 00; 2, $30 00; 3, $40 00.
Metal.—Babbitt.....No. 1, 35c; 3, 25c; 5, 15c ₩ lb
Nails.—10d and larger.....$2 60
Nail Pullers.—Little Giant—Small.....per doz., $22 00
Little Giant—Large.....30 00
Padlocks.—Wilcox.....dis 33½&5 %
Picks.—K. P. & Co., Solid Eyes.....5 to 6 / 6 to 7
$9 00 / $9 50
Pins.—Universal Hatand Coat all wood—
2 in.....₩ gross $2 50; 3 in., 3 50; 4 in., 4 50—dis 15 %
Planes.—Auburn Tool Co.....dis 40 %
N. Y. Tool Co.....dis 50 %
Plated Ware.—Rogers Bros.....dis 40 %
Pocket Knives.—Conn. Cutlery Co.....new net list
American Shear Co.....new net list
Plumb & Levels.—Stanley.....dis 60&10 %
Pulleys.—Axle.
Fr'me pol. wh't pt. face, No. 15, 1¾ in., 20c.; 16, 2 in., 26c.
Pol. wh't br'zed face No. 115, 1¾ in., 20c.; 116, 2 in., 26c.
Pulley Blocks.—"Best Boston Make".....net
Rail Barn Door.—For Novelty and Anti-friction Hangers.....per foot 7c.. dis 40 %
Refrigerators.—Reina Patent.....dis 20 %
Rivets.—Black.....dis 40 %
Carriage, oval head, Nos. 3, 4, 5, 6, 7, 8, dis 30 %
13 13 14 14 15 16c ₩ lb
Sad Irons.—Bliss & Drake.....₩ lb 3½c
Sand Paper.....dis 15 & 5 %
M. B. & D.....0 to 2, $4 25; 2 to 3, $4 75
Saws.—*Hand and Panel*—
X Cut, Wheeler, Madden & Clemson.....per ft., 35c
" Champion..... " 45c
" Lightning..... " 45c
" Great American..... " 50c
Wood Saws, Welsh & Griffith.....₩ doz $12 00
Wheeler, Madden & Clemson's, same list as "Diston's".....dis. 20 %
Diston's.....dis. 20 %
Saw Horses.—Extra.....₩ doz $2 25
Folding..... " 3 50
Screws.—Am. Screw Co., new list Sept. 1st.....dis 60 %
Aiken's.....dis 60 %
Scythe Stones.—
"Willoughby Lake," first quality.....₩ gross $6 50
" " second quality..... " 5 00
Shovels.—O. Ames.....dis 30 %
M. B. & D.....dis 30 %
Spading Forks.—W. C. & Co.....dis 40 %
Tools.—Aiken's Pattern.....₩ doz $5 00
Aiken's Genuine, $12.....dis 40 %
" Saw Sets, $13.....dis 40 %
Traps.—Oneida.....dis 25 %
Blake's.....dis 40 %
Vises.—K. P. & Co.'s Solid Box. Blacksmith....₩ lb 12c
Parker's Parallel.....dis 10 %
Backus.....dis 25 %
"Howard's." Parallel.....dis 25 %
Wardrobe Hooks.—Wire to drive.....₩ gross $1 00
Weights.—Window Weights.....₩ lb 4½
Wedges—Axe.....₩ doz 33
Wire.—
Eureka in spools. No. 28 to 40 assorted...₩ gross $8 50
Wire Netting.—Clinton Wire Cloth Co., Green, 4½c
Drab or Black.....₩ ft 4½c
Wrenches.—Genuine Wrenches, G. A. Coes...d's 40 & 10%
Wringers.—Universal XX No. 2.....₩ doz $66 00
Novelty, No. 10..... " 63 00
No. 2..... " 66 00
No. 22..... " 70 00
Excelsior A, with bench..... " 84 00
" E, set tubs..... " 72 00
Eureka..... " 57 00
Welcome..... " 60 00
Wilmington, Cooley & Co.—Hoes, Rakes, Forks &c. dis 40 %. Special rate for Export.

ST. LOUIS.

Corrected weekly by Semple & Birge Mfg. Co.

Animal Pokes.....$7 50 ₩ doz. net
Apple Parers.—Conqueror.....₩ doz $7 75
Hudson's Rotary..... " 7 75
Axes.—Wm. Mann's, Red Warrior.....₩ doz 9 75
"C. Marshall"..... " 9 25
Handled..... " $5 extra
Double Bitted..... " 19 50
Hunt's..... " 12 00
Axles.—"Jones, Henry & Co.'s" Patent Lubricating, Half Patent, Swelled Taper, Plain Taper and Concord Axles.....dis 25&5 %
Common Axles (Pat. Lubricating), 1⅛ inch and upward.....₩ lb. 6c
do. less than 1⅛ inch..... " 6½c
Babbitt Metal.—

Nos.	4	3	2	1	A 1	Genuine.
	9½	11	16½	20	31	34c ₩ lb.

Bellows.—Best St. Louis make.....40c ₩ in. net
Bells.—Troy, Church, School and Farm Bells..₩ lb 35c
"Improved Amalgam Bronzed," 15 in., $7 00;
12 in., $2 50; 10 in., $4; 9 in., $5; 24 in., $14; 27 in. $19 50
Belting.—"Boston Belting Co.'s" Rubber.....dis 50&10 %
Bradford & Sharp's" Oak-Tanned Leather....dis 40 %
Boilers.—Farmer's Pront Feed Boilers.....dis 20 %
" Caldrons.....dis 25 %
" Sugar Kettles.....dis 30 %
Bolts.—Arms, Bell & Co.'s Carriage & Tire..dis 70 & 10%
Butts.—Western Butt Co.'s new list—
Narrow Fast Joint.....dis 35, 12½&10 %
Broad Fast Joint.....dis 35, 12½&10 %
" Loose " .....dis 45, 12½&10 %
Reversible.....dis 40, 12½&10 %
" Japanned and Silver Tipped..dis 50, 12½&10 %
Loose Joint " Acorn" " " ...dis 45, 12½&10 %
Churns.—Julian, No. 2, $7 00; No. 3, $7 50; No. 4, $8 50.....dis 25 %
Cider Mills.—
American Senior, $32 00; Am. Junior, $18 50.....net
Corn Drill.—Campbell's Patent, $19 00.....net
Corn Knives.—Dunn Edge Tool Co.'s Chp.....₩ doz 4 50
Seymour Mfg. Co.'s Solid Steel Back..... " 4 50
Corn Shellers.—Sandwich Mfg. Co.'s—
Power Shellers.....dis 10 %
Hand Shellers.....Special rates
Corn Stalk Cutters.—
Pekin Single Row Machine, $20.....dis 20 %
" Double Row " $25.....dis 20 %
Cotton Gins.—Carver, with 10 in. Saws, $75 a Saw..net
12 in. Saws, $4 00 a Saw.....net
Crow Bars.—Steel Pointed.....₩ lb 6c
Drag Saw Machines.—
Culver's Iron Drag Saw.....dis 15 %
Excelsior Drag Saw with Log Trucks.....dis 12½ %
Fanning Mills.—Nash & Cutts.....dis 25 %
Feed Cutters.—Improved Buffalo Nationsl...dis 20 %
Sanford No. 1, $10 00; No. 2, $8 00.....net
Bowman's Lever Cutter, $6 50.....net
Files.—Black Diamond, Mill.....$5 00 & currency
" Bastard.....5 00 & currency
" Taper.....5 00 & currency
Forges and Blowers.—
Keystone Portable Forge Co.'s.....new list
Forks and Hoes.—
Auburn Mfg. Co.'s Hay and Manure Forks...dis 40 %
" " Handled Hoes.....dis 40 %
Garden Seed Drills and Wheel Hoes.—
Allen's Double Wheel Hoe.....dis 20 %
" Planet Drill, Nos. 2 and 3.....dis 20 %
" Combined Drill and Wheel Hoe.....dis 20 %
Grinding Mills.—Challenge Feed Mills.....dis 15 %
Sedgebeer's Nonpareil Mills.....dis 15 %
Bradford's French Burr Mills.....net list
Hammers.—Masons' Hammers.....₩ lb 14c
Smiths' Hand.....20c
Handles.—No. 1 Fork, Hoe and Rake.....dis 20 %
No. 2 Fork, Hoe and Rake.....dis 30 %
Ax, Pick, Sledge and Small Handles.....net list
Hay and Cotton Presses.—
Dederick's Railroad.....net list
" Perpetual.....net list
Hay Knives.—
Dunn Edge Tool Co.'s.....₩ doz $12 00 net
Lightning (Weymouth's Patent).....₩ doz $30 00
Horse Hay Fork.—Nellis' Harpoon...$8 50 each net
Horse Nails.—National Patent Pointed.....Ace rates
National Patent Pointed, extra finished.....25c "
Horse Powers.—Pitts or Carey's Patent.....dis 10 %
Wheeler's Railway.....dis 10 %
Sandwich Lever.....dis 10 %
Hose.—
Boston Belting Co.'s Rubber Medium Sizes..dis 30&10
" " " S. Siz. Hydrant..dis 40
Mattocks and Grub Hoes.—
Klein, Logan & Co.'s Mattocks....₩ doz $11 75 @ 18 50
" Grub Hoes, oval eye " 8 50 @ 9 25
Money Drawers.—
Pierpont & Co.'s Excelsior.....per doz $38 00 net
Nails.—Wheeling Riverside Brand.....$2 80 rates
Packing.—Boston Belting Co.'s Rubber, Plain..dis 30 %
Boston Belting Co.'s Rubber, Pure.....dis 25&5 %
" " No. 3 Plain.....dis 40 %
" " Round and Square....dis 10&10 %
Picks.—Railroad and Clay.....₩ doz $8 00 @ 10 00
Coal..... " 7 45 @ 8 40
Pick..... " 11 60 @ 13 85
Stone..... " 14 40 @ 14 90
Tamping..... " 14 75 @ 15 35
Miners' Drifting..... " 75 @ 11 75
Plows.—Avery's Cast and Steel.....dis 20 %
Avery Sulky Plow.....dis 20 %
Collins Cast Cast Steel.....new list net
Pekin Steel.....dis 25 %
Plow Sulky.—Buckeye.....$29 25 net
Post Hole Augers.—Clark's Patent—
No. 1, ₩ doz. $27; No. 2, $30; No. 3, $32.....dis 25 %
Pulleys.—5 inch.....per doz $3 70 net
4 inch.....per doz 2 50 net
Nellis' Patent.....dis 20 %
Pumps.—St. Louis Farm, Patent Metal Lined..dis 30 %
Rakes.—Advance Paddock Sulky.....each $25 00 net
St. Louis Revolving 14 tooth..... " 4 45 net
" " 16 " " 4 65 net
" Hand Hay Rake.....per doz $2 50
Reaper Knives and Sections.—
Geo. Barnes & Co.'s Knives.....dis 50 %
" " Sections.....dis 40 %
Road Scrapers.—Steel.....each $3 50 net
Cast Iron.....dis 10&5 %
Saws.—Curtis & Co.....dis 15 %
Scythes.—Dunn Edge Tool Co.'s.....dis 30 %
Scythe Stones.—No. 1 Ind'n Pond ₩ gr's, $7 00
Extra Indian Pond " 7 50 } dis 25
Premium " 10 50 }
Diamond Grit " 13 00
Shovels and Spades.—Groom Shovel Co...dis 40 %
Grain Scoops—Patent Cor'd Straps Groom Shovel Co .....dis 40 %, and 50c per doz extra
do. M. Rowland & Co., dis 30 % and 25c " "
do. O. Ames & Son, dis 25&5 % and 25c " "
Sledges.—Smith's Stone or Coal Sledges—
Steel Face Polished.....₩ lb 15c net
Solid Cast Steel.....10c net
Snaths and Cradles.—Seymour Mfg. Co.'s.....dis 20 %
Sorghum Machinery.—Ben Cane Mills.....dis 25 %
Scantlin's Seamless Evaporators.....dis 15%
Springs.—Cleveland Spring Co.'s—
Carriage and Express.....₩ lb 14
Blue Seat Springs.....₩ pair, $10
Thimble Skeins.—Whitewater's.....dis 40&10 %
Vises.—Wilson Mfg. Co.'s.....₩ lb. 14½
Wheelbarrows.—Champion Iron Wheel..₩ doz $21 00
Champion Wood Wheel.....₩ doz 29 00
" Garden.....₩ doz. 36
Wagons.—Whitewater Farm Wagons—
Thimble Skein.....3 in. $74; 3½ in. $78 3¼ in $79
Iron Axle.....1⅜ in. $88; 1⅝ in. $81; 1¾ in. ...
Wire Bale Ties.—Buckeye Double Twist....net list
Dederick Adjustable.....net list

St. Louis Metal Market.

(Corrected Weekly by Messrs. R. S Hunt & Co.)

Tin Plate.

IC, 10x14, Best Char..	$ 8 00	IXXX, 14x20, B. Char.	$15 50
IX, 10x14, " ..	10 50	IXXXX, 14x20, " ..	18 00
IC, 12x12, " ..	8 00	IC, 20x28, " ..	30 00
IX, 12x12, " ..	10 50	IX, 20x28, " ..	29 00
IC, 14x20, " ..	8 00	IXX, 20x24, " ..	31 00
IX, 14x20, " ..	10 50	IC, 14x20, Best Roof..	7 50
IC, 12x24, " ..	9 00	IX, 14x20, " ..	10 00
DX, 12½x17, " ..	10 50	IC, 20x28, " ..	15 50
DXX, 12½x17 " ..	13 00	IX, 20x28, " ..	20 00
IX, 14x14, " ..	19 00	IC, 10x14, Best Coke..	7 00
IXX, 14x14, " ..	22 00	IC 14x20, " ..	7 00
IXX, 14x20, " ..	13 00	IC, 10x20, " ..	11 50

Sheet Iron.

	Com'n.	S.L.U.D. Ref'd Sm'th	Am'n's Sm'th
No. 16 to 20	3 4c	5 4c	6c 7 9c
No. 22 to 24	3 5c	4 4c	6c 7 9c
No. 26	3 5c	4 6c	6½c 8 1c
No. 27	4 c	4 8c	6½c 8 3c

Genuine Russia Iron.

Perfect—No. 9, 10, 11, 12.....per lb. 14c
No. 1 Stained—No. 9, 10, 11, 12.....per lb. 13c
Tare 22 lbs. to Bdle. For less than Bdle. add 1c. ₩ lb.

Patent Planished Iron.

No. 24 to 27, A quality.....per lb. 12c
" B " 10c
For less than Bdle. add 1c. per lb.

Galvanized Sheet Iron.

Juniata, or 1st quality.....dis 5 %

Block Tin.

Straits, Large Pigs	22c	Straits, Small	24c
Eng. Ref'd, Large Pig	23c	Bar	25c
do Small	24c		

Solder.

Extra in Bars	15c	No. 2, in Bars	13c
No. 1, in "	14c	in Bars	8½c

Pig Lead—Pigs, 7c

Antimony	18c
Bismuth	$3 01
Nickel	3 50

Crucibles.—Dixon's.....₩ No. 5c
Babbit Metal.

No. 1	₩ lb. 20c	No.	₩ lb 14c
" 2	" 18c	"	" 9c

Copper.

Brazier's, 30x60, 14 to 100 lbs. Sheets	32c
" " 10, 11 & 12 lbs., "	34c
" " 8 and 9 lbs. "	36c
" " 6 and 7 lbs. "	38c
Tinned, 14x48, 14 and 16 oz.	32c
Planished, 14x48, 14 and 16 oz.	38c
" Boiler Sizes, 14 and 16 oz.	41c
Gutter Copper, 20x72, 10 and 12 lb. Sheets	34c
" 20x72, 14 lb. Sheets	32c
" 24x72, 10 and 12 lb. Sheets	34c
" 24x72, 14 lb. Sheets	32c
Reservoir Copper, 16x60 and 18x60	35c
Bar Copper, Square and Round, ⅜ to 1⅝ inch	36c
" " " ⅝ inch	36c
Copper Bottoms	34c
Copper Nails	45c

Brass.

Roll, No. 10 to 28, 12 in. in width	30c
" 30, 17 in. in width	31c
" 24, 16 "	36c
" 31, 16 "	37c
" 36, 16 "	39c
Platers, No. 40, 6 "	53

Brass and Copper Wire.

	Brass.	Copper.		Brass.	Copper.
No. 0 to 20	34c	45c	No. 24	39c	50c
" 21	35c	46c	" 25	42c	53c
" 22	36c	47c	" 26	44c	55c
" 23	37c	48c	" 27	46c	60c

Brass Spring Wire, 2c. ₩ lb advance.

Brass Tubing.

Plain to No. 20	45c	5-16 Inch	30c
⅜ inch	50c	¼ "	30c

Copper Rivets and Burs.....dis 10 %
Brass Kettles.....₩ lb 45c
Sheet Zinc.—600 lbs. cask.....7½c
250 lbs. cask.....8½c
Sheet.....new 8½c
Wire.—Iron, Bright Market.....new ...dis 50 %
Iron, Coppered Market.....dis 45 %
Fence, Nos. 7, 8 and 9.....₩ lb 4½c
Trellis, Nos. 10 and 11.....5¼ c
" No. 12.....5½c
Hay Baling, Charcoal, No. 10 and 11.....5½c
" No. 12.....5½c
Broom, Tinned, Nos. 18 to 22.....12c
Fence Staples.....per keg of 100 lbs. $6 25
Per 10.....6½c
Iron Rivets.—Black, papered.....new dis 25 %
Tinned, papered.....dis 25 %
In bulk.....new 3-16 ¼ 5-16 ⅜ & ½ in. diam.
11¼c 10½c 10 c 9½c per lb.
Sad Irons.....₩ lb 3½c
Enameled Kettles.—Standard Mfg. Co.....dis 55 %
Enameled Sauce Pans.
Standard Mfg. Co.....dis 40 %
Enameled Boilers.—Standard Mfg. Co.....dis 40 %
Dripping Pans.—Smooth Iron.....₩ lb 10c
Geneva Fluters.....per doz $15 00
Monroe Fluters.....14 50
Stove Polish.—Dixon's.....per gross 6 00
Gem.....4 50
Japanese.....3 50
Dixon's, in bulk.....₩ lb 6c
Coffee Mills.—Parker's.....dis 20 %
Granite Iron Ware.....dis 25 %
Spoons.—New List.....dis 10 %
Retinned Iron Ware.....dis 33½ %
Plain Stamped Ware.....dis 20 %
Japanned Ware.—St. Louis list.....dis 40 %
Fry Pans.....dis 5 %
Ears.....dis 50

THE JUDSON GOVERNOR.

It is a common method to advertise Governors *without cost*, unless satisfactory to the customer, and then charge *High Prices* for doing what any good Governor will do. Various Governors inferior to the "Judson" are sold in this way, operating well enough for three months, to insure collection of the pay, but becoming useless after a year's wear—their construction lacking durability. The Judson Governor is guaranteed to be not only the best Regulator of Steam Engines, but also the most durable Governor made. Parties in buying other Governors should stipulate that their durability be guaranteed, and should also take care that they do not for much inferior Governors, pay higher prices than those shown in the accompanying list. We guarantee the Judson Governor will do all any other Governor can do, and in Accuracy and Durability—the main essentials—we guarantee it shall do more.

Reduced Price List,

FEBRUARY 1, 1877.

☞ For dimensions of Governor, see Illustrated Price List.

THE JUDSON PATENT

Improved Steam Governor.

Size, Inch.	Plain.	Bright Finished.	Extra for Sp'd'r	Stop Valve.
¼	$16 00	$18·00	$1·90	..
¾	18·00	20·00	1·90	..
1	20·00	22·00	2·00	$5·00
1¼	23·00	26·00	2·25	6·00
1½	26·00	30·00	2·50	8·00
2	31·00	35·00	2·75	10·80
2¼	36·00	41·00	3·25	12·00
2½	40·00	45·00	3·50	14·00
2¾	45 00	51·00	3·75	16·00
3	50·00	57·00	4·25	19 00
3½	59·00	67·00	4·50	23·00
4	69·00	78·00	5·00	28·00
4½	80·00	90·00	5·50	34·00
5	90·00	101·00	6·00	40·00
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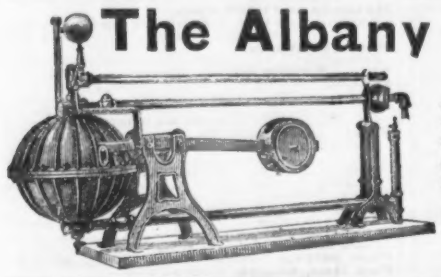

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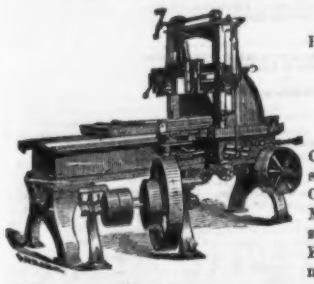

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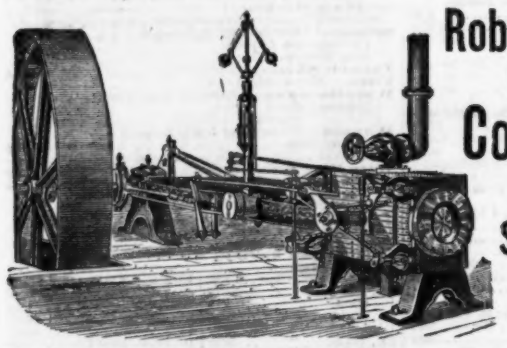

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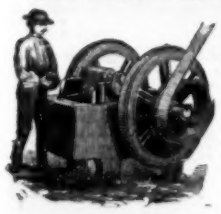

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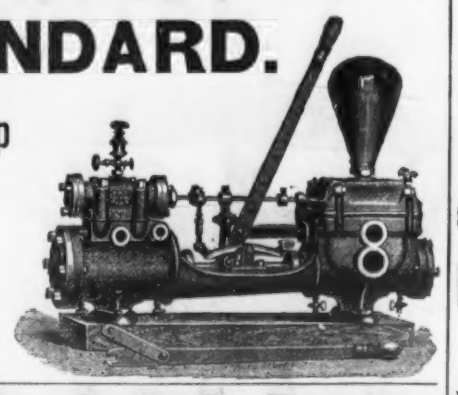

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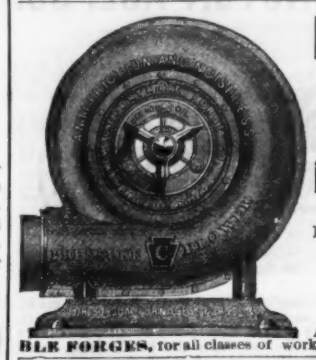

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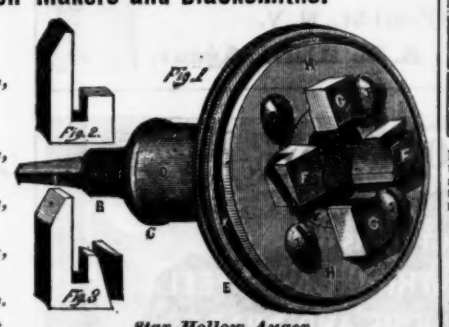

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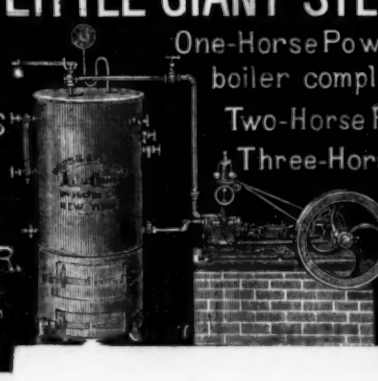

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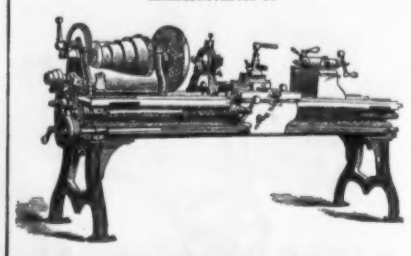

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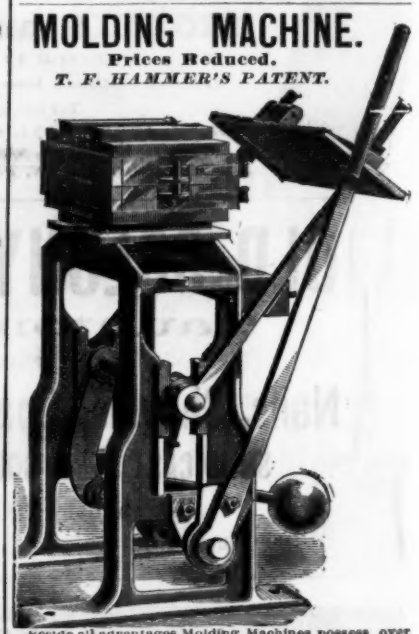

Beside all advantages Molding Machines possess over hand molding, it is especially claimed for this machine that it requires no special flasks or boards but the same are used as for hand molding; it occupies no more room than a bench for hand molding; it produces at less cost more, smoother and uniform castings.

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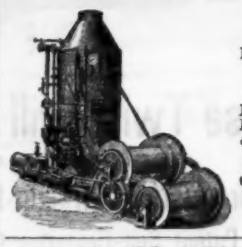

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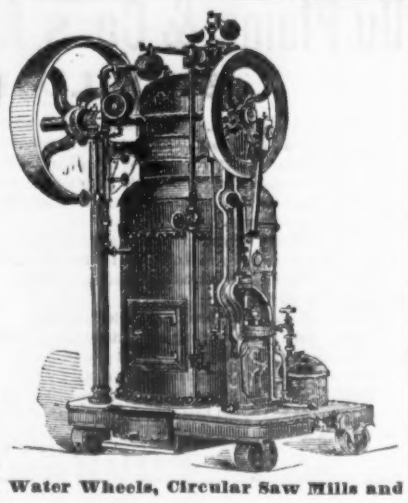

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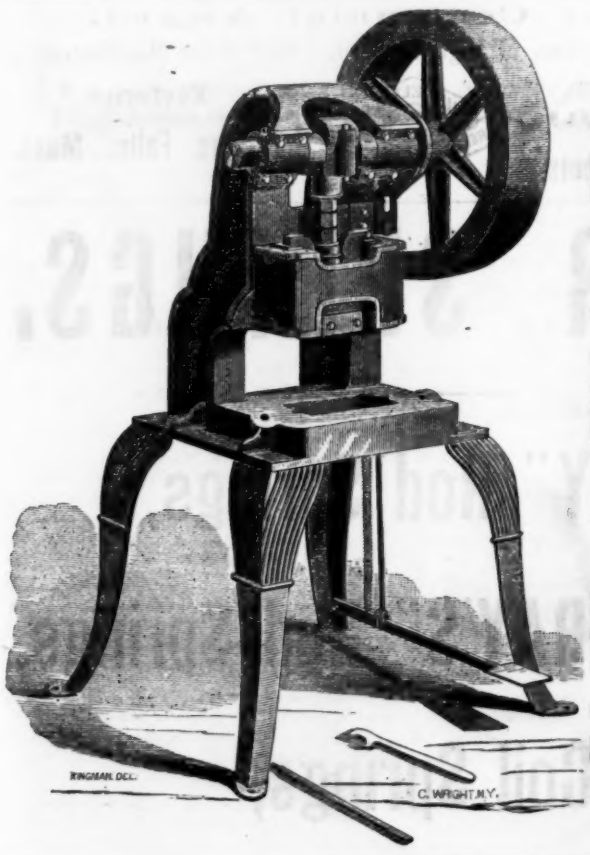

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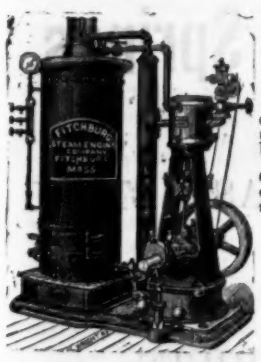

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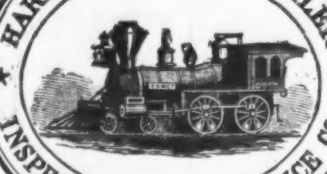

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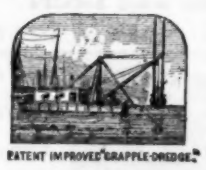

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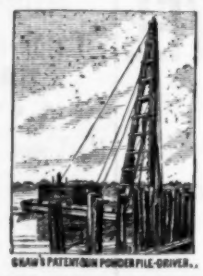

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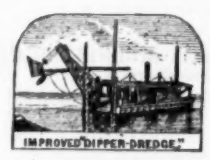

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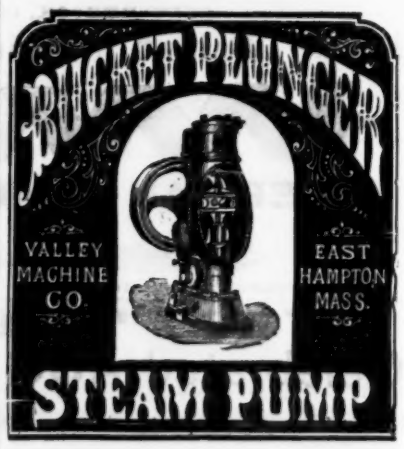

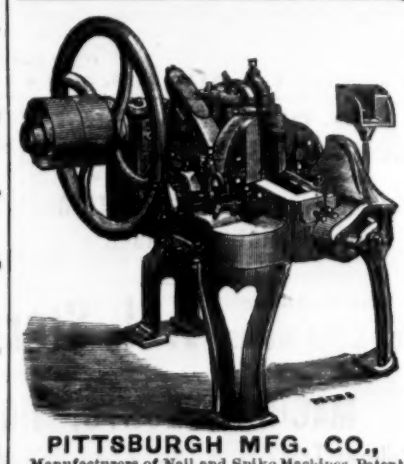

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